6-2012

Effects of Income Inequality on Economic Growth

Madelyn Degutis
Union College - Schenectady, NY

Effects of Income Inequality on Economic Growth

By

Madelyn N. Degutis

* * * * * * * * *

Submitted in partial fulfillment
of the requirements for
Honors in the Department of Economics

UNION COLLEGE

June, 2012

ABSTRACT

DEGUTIS, MADELYN N. Effects of Income Inequality on Economic Growth. Department of Economics, June 2012.

ADVISOR: Suthathip Yaisawarng

Economic growth reflects the change in the overall well-being of a country and the standard of living of its population. It is important to understand what factors affect economic growth. This thesis hypothesizes that income inequality negatively affects growth. A country-level data set of 114 countries for 2000 and 2005 is used to estimate a growth model. The dependent variable, the five year average of economic growth per capita, is regressed on a set of standard factors (human capital, investment, and technology), institutional factors (political stability, corruption, and property rights), income inequality, and demographic factors (gender equality and racial diversity). The model also includes lag of per capita income to capture convergence.

Regression results indicate that income inequality hurts economic growth, and that countries in Latin America and the Caribbean, the Middle East and North Africa, and Sub-Saharan Africa perform poorly compared to East Asia and Pacific. To reduce inequality and promote growth, countries could improve education and make taxes more progressive. Country-specific case study reveals that the Chinese government attempts to solve income inequality between rural and urban populations largely through taxes and subsidies. Argentina, on the other hand, still struggles to reduce its high level of income inequality.

Table of Contents

List of Tables

CHAPTER 1

Introduction

The economic growth that a country experiences is a very important measure which can show how well a country is doing economically and otherwise. It reflects the change in the overall well-being of the nation and relates to the standard of living experienced within that country. There are great disparities in the growth rates of economies throughout the world. While some countries such as Chin and Finland can boast sustained, relatively high rates of growth, other countries, such as Burundi and Djibouti, may experience a growth rate that is negative. There are also countries whose growth rates are relatively stable and countries whose growth rates are more volatile and less predictable. Understanding why different countries have such different growth rates can help countries utilize the different tools at their disposal, such as taxes and laws, to improve their growth rates.

The growth rate within a country depends on innumerable factors. Many of these factors have been determined while others are not understood. This thesis studies certain factors which theoretically affect economic growth to determine the effects that they have in an empirical study. It attempts to answer the following question: How do the basic (human capital, investment, and technology), institutional (political stability, corruption, and property rights), economic (income inequality and initial GDP), and demographic (gender equality and racial diversity), factors affect economic growth in countries throughout the world? It specifically focuses on the effect of income inequality as its results are not fully understood or agreed upon. It also examines whether a country's location affects its growth.

This thesis finds that most variables behave as they have in previous studies when they are significant. The most important finding of this thesis, however, is that income inequality harms economic growth. The implication of this finding is that there is an economic rationale for decreasing income inequality. This should encourage countries with high levels of income inequality to make efforts to reduce it in order to improve their economic growth. Finally, region does play a role in economic growth, specifically Latin America and Caribbean, Middle East and North Africa, and Sub-Saharan Africa behave poorly in comparison to East Asia and Pacific.

The thesis is organized as follows: Chapter 2 provides a review of the existing literature and discusses the background and determinants of economic growth. Chapter 3 explains the methodology used in this study and explains the use of case studies. Chapter 4 presents the sample and explains how the data set was created. Chapter 5 discusses the empirical results and presents case studies of two specific countries to enhance the regression analysis. Chapter 6 concludes the thesis; it summarizes the findings, discusses implications of the findings, points out the strengths and weaknesses of this study, and suggests areas for further research.

CHAPTER 2

Background and Determinants of Growth

Studying economic growth and the many factors that affect it, both positively and negatively, is important and popular due to the many effects that economic growth has on a country and its citizens. There have been many studies of factors that affect economic growth, some of which are in agreement with one another, while others are conflicting. This chapter reviews empirical and theoretical papers that have been written for better understanding of economic growth and its causes. It focuses on the factors that will be examined in this thesis. The chapter is organized as follows: Section 2.1 explains some basic concepts of economic growth including how it affects society, its importance, basic theories, and how it relates to standard of living. Section 2.2 discusses multiple institutional factors (political instability, corruption, and property rights) with regard to how they affect economic growth. Section 2.3 examines economic factors that affect economic growth, specifically income inequality, and gives suggestions for improving it. Section 2.4 describes the conflicting arguments and findings of how demographic factors such as gender and racial inequality as well as social mobility affect economic growth. Section 2.5 concludes the literature review and indicates which variables will be most focused on in this thesis.

2.1 An Overview of Economic Growth and its Effect on Society

Economic growth of countries in the long run is an extremely important concept to study. Although economies may have many ups and downs in the short run and these also are important to examine, the long term economic growth of a nation has a

significant impact on that country. Economic growth is based on overall increase in output over an extended period of time. This can be measured in many ways, but the concept remains the same. The amount of economic growth in a country fluctuates from year to year and there are vast differences between countries throughout the world, which has many implications, both economic and other (Blanchard 2009). The patterns of growth seen within some countries, such as those of North America and Western Europe, are extremely different than the patterns seen in Africa, for example. Although some of the underlying reasons for this are known, the reasons for these differences are not completely understood (Blanchard 2009).

One of the reasons that economic growth is so important to study is that it can give a sense of the standard of living of the people within a country and whether this standard of living has improved over the years. It can also be used to look at the differences in standards of living across countries. There are vast differences in the standards of living between different nations and discovering the reasons behind these differences can help improve the conditions. Because there is a focus on standard of living of the people of a country, it is important to study economic growth per capita rather than as a whole, so that increases in the population are accounted for when calculating the economic growth.

Although the standard of living in and of itself is an important measure to see the levels at which people across the world have their wants and needs met, it is important for another reason. It is somewhat of a proxy for the happiness of the population of a country. Increases in the standard of living cause higher levels of happiness and life satisfaction, especially among poor people. According to Blanchard (2009), in countries

where the output per person is below $20,000, an increase in the standard of living does increase their level of happiness. In countries where the output per person is higher than that, the relationship is not as strong. Overall, there are more "very happy" people among the rich portion of the population and "not too happy" people among the poor (Blanchard 2009). This shows that economic growth is not just an important measure economically, but it is also important to the daily lives of the population of a country.

There are many different growth models and theories today that attempt to identify which aspects of production lead to economic growth overall. There are certain features that many countries with economic growth share and these are interesting to note. The ratio of capital investment to output remains constant for the most part. Also, there must be technological improvement and innovation. Additionally, overall, real wages of workers grow as the economy grows. Finally, capital stock grows more quickly than the labor supply in these countries (Economic Growth Models 1995).

There are many theories behind economic growth, but one basic theory which is commonly used today is that of Robert Solow. It starts with the idea of an aggregate production function. This shows that aggregate output is a function of aggregate capital stock and aggregate labor stock. These are both important elements of output, but another extremely important factor is technology; increases in technology can improve the amount of output produced by the same amount of capital and labor. In today's modern world, technological advances can make enormous differences. Technology and capital accumulation are reasons that even though decreasing returns to capital and labor exist, there can be increases in outputs. Technology and capital accumulation are both used in a broad sense here and can be improved in many different ways. Technology depends on

many factors, such as education, research and development, and institutions, such as those which enforce property rights. Capital accumulation is affected by the savings rate within a country (Blanchard 2009). In order for a country to increase the level of capital accumulation through savings, there must be a short run decrease in consumption of that country. The idea behind this is that at a certain ideal level of consumption, there will be a decrease in current consumption in order to increase savings but that in the long run this will allow for an overall increase in consumption in the future. Governments can make policy changes that affect consumption levels as well as savings. These policies have effects both when they are put in place and in the future (Blanchard 2009).

Another factor which can affect economic growth theoretically is convergence, or the catch-up effect. There is much debate amongst economists as to whether this phenomenon exists or not; there are theories and empirical work to support each side of the argument. Economic convergence is the idea that poor countries grow more quickly than rich countries (catching up) and therefore there is an overall convergence between countries of varying wealth. Other economists argue that rich countries grow faster than poor countries so that the gap between the two becomes larger, rather than converging. Additionally, there are theories stating that convergence occurs, but only under certain conditions, such as when a country meets a minimum amount of human capital (Sachs and Warner 1995). Although its effect on economic growth is not understood nor agreed upon, it is a potential factor affecting economic growth.

Economic growth is generally considered to be an attractive goal of nations, especially with regard to their economic policies. Economic growth however, has both positive and negative impacts on a country. It is important for policy makers and the

general population to understand both aspects of economic growth and the consequences. On one hand, it can represent an increase in the overall wealth of a country. This then allows the people within that country to increase their consumption of goods and services. These increases in consumption are spread throughout many areas of the economy, but some very important areas are health and education. This results in an increase in the standard of living in that country. On the other hand, there are many possible negative results of economic growth. It can deplete the natural resources used to produce goods. This can decrease the natural resources available for future production. It can also have a negative impact on peoples' daily lives, raising environmental concerns. The depletion of resources, as well as any negative externalities caused by production such as pollution, are problems that are either caused or exacerbated by economic growth (Economic Growth 2006). The benefits of economic growth must be weighed against the disadvantages that it causes within a country. This thesis looks at factors that affect economic growth, both positively and negatively, with the assumption that countries want to increase their economic growth and therefore their standard of living. Although improving economic growth is a good goal for most countries, environmental concerns need to be kept in mind by policy makers.

A factor which is widely accepted as an important factor in encouraging economic growth is education. Both formal and informal educations give people opportunities to succeed in life or to attain desired jobs. Education could encourage entrepreneurship, inventions, or smart business decisions. It could also give someone from a poor background the opportunity to succeed financially. The belief that having good systems of education helps economic growth is common. An aspect of education which makes it

even more important is the idea that, in addition to its direct benefits, education can also indirectly improve economic growth through its effects on culture and norms of a society. In their paper, Bangwayo-Skeete et al. (2011) discuss the multiple indirect ways which education positively affects economic growth. It has been found that certain cultural values can help or harm economic growth, but the authors claim that any cultural values that encourage individual economic achievement also help the economy as a whole. Their study aims to determine which aspects of culture encourage economic growth and how these specific aspects can be promoted within the society.

They argue that "education (both formal and informal) has a systematic impact on an individual's cultural values and fosters the cultivation of growth promoting norms" (Bangwayo-Skeete et al. 2011, 164). Formal education is provided primarily through schools, which are social institutions, and because of their influence on students they "not only impart skills but also impart an image of ideal students in terms of characteristics and behavior" (164). Certain skills learned in schools directly help economic growth because students are taught the tools with which to succeed economically. Less directly, school can help students develop specific attributes that also improve growth. Some of the attributes that can lead to economic success include "persistence, motivation, self-regulation and charm" (164). The authors also discuss the importance of informal education which is education that is not related to school, the kind that happens in day to day life. The authors specifically mention mass media as an important factor in informal education. This type of education can also foster growth by increasing the amount that a person values economic success (Bangwayo-Skeete et al. 2011).

Bangwayo-Skeete et al. (2011) study 60,579 people from 43 countries in 2005 to determine the relationship between education, cultural values, and economic growth. They find that formal educations (education which occurs within a school or classroom setting) and informal educations (education which occurs outside of a formal school or classroom setting, such as mass media or social groups) have the positive impact on cultural values that encourage economic growth that they expected. Formal education is measured by the amount of formal schooling a person had achieved whereas informal education was "proxied by access to mass media…and social networks an individual participates in" (Bangwayo-Skeete et al. 2011, 166). This demonstrates that education is an extremely important aspect of culture for countries that want to improve their economic growth. Its effects are not simply the direct effects which have been studied previously, but also the indirect effects that education has on cultural norms. For example, they found that when people have more of a formal education they tend to place a higher value on achievements rather than on obeying the conventional rules of society. Hence, there are economic benefits for a country to have policies that encourage education among the citizens of the society (Bangwayo-Skeete et al. 2011).

2.2 Effect of Institutional Factors on Economic Growth

Of the many factors that affect economic growth throughout the world, previous studies have shown that political instability is an important factor. For example, Alesina, Özler, Roubini, and Swagel (1996) analyze the relationship and correlation between political instability and economic growth using 113 different countries over the period of 1950 to 1982. They define political instability as "the propensity of a government to

collapse" (Alesina et al. 1996, 190) or "the propensity of a change in the executive power, either by constitutional or unconstitutional means" (Alesina et al. 1996, 191). Their study not only considers whether political instability negatively affects economic growth, but also whether the reverse is true: whether low economic growth causes political instability. They explain the theories behind these two ideas.

Political instability can decrease the economic growth within a country because there is more uncertainty with regard to politics. This raises risks associated with investment and hence people are less likely to invest and save their money in their own country. People may choose to either save less or invest in foreign countries where the political environment is more stable. This lack of domestic investments decreases the capital stock available and therefore harms economic growth. In addition, a country that is politically unstable is much less likely to attract investors from other countries, further affecting the economic growth of that country (Alesina et al. 1996).

At the same time, a slow or negative economic growth can actually lead to more political instability within a country. The reasons for this differ between democracies and non-democracies. In a democracy, people are less likely to reelect a leader if there has been a low rate of economic growth under him/her. Even though it may not be the fault of the leader that economic growth was slow, it still decreases his/her chances of being re-elected. In a non-democratic society, low economic growth can still create political instability. If, for example, there is very low economic growth under a dictator in a country, the people of that country are more likely to rebel against the dictator. This unrest among the people due to the poor economic growth can lead to political instability, sometimes in the form of a coup d'état (Alesina et al. 1996). The fact that political

instability can harm economic growth and that low economic growth can lead to political instability is extremely important. Political instability may be an important factor in determining economic growth, but there may be issues of causality since each one affects the other.

The authors give a compelling example to show how important political instability could be as a factor of economic growth. In the early 1900s, Argentina was a very wealthy country and it remained that way for some time. Japan, on the other hand was not one of the wealthiest in the world into the middle of the 1900s. Since then, Argentina, a country with a high amount of political instability, including much political violence, has had periods of extreme economic decline. Japan, which is relatively stable politically, has had very high growth rates. The growth, and lack thereof, in Japan and Argentina clearly has many complicated causes, but they show why studying political instability as a factor of economic growth makes sense historically.

The authors test whether political instability harms economic growth or whether low economic growth causes political instability using two different equations, measuring economic growth as per capita GDP growth. They conclude that political instability does have a significant negative effect on economic growth. However, neither present low growth in an economy nor low growth of an economy in the recent past significantly increases the political instability of that government (Alesina et al. 1996). This finding suggests that the potential problem of causality is not an issue with an exception for the extreme case of a coup d'état where low economic growth can lead to political instability (Alesina et al. 1996). They also find that although political instability does decrease economic growth, the political systems themselves do not play as much of a role. They

do not find any significant effect of a democracy on economic growth, showing that political stability is more important to growth than democracy or lack thereof (Alesina et al. 1996).

Another way that political instability can affect a nation's economic growth is through the political instability of neighboring countries. Ades and Chua (1997) discuss the role that regional instability plays in economic growth. They define regional instability as "political instability in neighboring countries" (Ades and Chua 1997, 279). The authors acknowledge exiting evidence that political instability harms economic growth within a country. Previous studies use various measures of political instability and come up with the same correlation, so the concept that political instability has negative effects on economic growth is well established. The authors explain reasons why this relation exists by stating that political instability "introduces uncertainty into the economic environment and might reduce, therefore, the incentives to save and invest by risk-averse economic agents" (Ades and Chua 1997, 280).

Another possible explanation given is that political instability reduces property rights or the ability to enforce property rights and therefore negatively affects economic growth. When there is political instability, especially severe instability such as civil wars, there are major disturbances to many aspects of the society which directly affect economic growth. Often, talented and qualified people within the work force leave the country to escape the political situation. There are also often problems with infrastructure that is needed for trade to continue as it usually would. For example, if a road or port that is along a trade route is destroyed, this disruption of trade can harm economic growth (Ades and Chua 1997).

The important aspect that Ades and Chua (1997) add to this area of research is that there are spillover effects associated with political instability. The negative consequences of political instability within one country can harm the economic growth of surrounding countries in addition to harming their own. There are many examples where this is the case, especially in landlocked countries. Ades and Chua (1997) offer two main explanations for why regional instability specifically has a negative effect on economic growth. First, regional instability interrupts trade flows and therefore international trade, both imports and exports, are lowered. International trade is a key factor in the economic development of a country which can improve productivity within a nation. If, for example, a landlocked country usually trades internationally with another country but cannot due to political instability in a neighboring country that the goods need to pass through, it will reduce the ability of that country to gain from that trade. On a more basic level, it can also prevent basic necessities such as food from being able to enter the country through trade. Regional instability could also reduce the ability of a country to communicate with the rest of the world, which could also harm economic growth due to a lack of information (Ades and Chua 1997). Second, regional instability increases the amount of domestic military spending by the government. If there is political instability or civil unrest in a bordering country, the government may increase military spending in order to keep the unrest out of their own country. Governments may also have to spend money on the military to prevent a huge influx of immigrants who seek refuge in their country. When the government is allocating more money to military spending, they most likely have less money to spend on other goods that could improve economic growth. The authors find that governments spend more money on military needs and less money

on education when there is regional instability, showing that the allocation of funds is moving away from ones that have a positive effect on economic growth (Ades and Chua 1997).

The authors study ninety-eight countries from 1960 to 1985 to determine the effects of regional instability on economic growth. Based on their regressions, the authors conclude that regional instability has a significant negative impact on economic growth, measured as steady state per capita GDP in a cross-section analysis (Ades and Chua 1997). Their evidence suggests that regional instability has about the same negative impact on economic growth as domestic political instability has (Ades and Chua 1997). This really proves the importance of the regional location of a country, since neighboring countries can have such a large impact on the economic growth of a country.

This presents a number of problems policy-wise because as hard as it is to improve political stability within one's own country, it is even harder to do so in another country. The authors suggest countries should focus on "policies directed at settling current territorial disputes in a peaceful and orderly manner" because it will help more countries than are directly involved (Ades and Chua 1997, 297). This could be done by neighboring countries or a region, or even an outside force, such as the United Nations in order to improve the economic growth of the entire region.

Both of the studies that relate political instability to economic growth provide evidence to establish the negative relationship between the two. However, they use data from prior to 1990, which is relatively outdated. Although the studies use different proxies for political instability, they both show that it negatively affects economic growth and the evidence supports one-way causality from political instability to economic

growth, i.e., political instability *causes* a decline in economic growth. Therefore, this thesis will not consider the theoretical claim of endogeneity between political instability and growth. The data used in this study will be more recent, and the definitions by-and-large will be similar.

Corruption is another important yet complicated factor to be taken into account when studying economic growth. Fréchette (2006) discusses some of the complexities behind studying corruption levels within countries and also explains the importance of corruption upon growth. He states that bureaucratic corruption can decrease the amount of investment in a country. This, in turn, harms economic growth. Another way that corruption affects growth is through the misallocation of resources. When corrupt practices occur, resources are not necessarily put to their best use possible, which reduces efficiency and therefore economic growth. He also presents the theory that if a government is corrupt, people who are intelligent and capable of performing well within certain areas of the government may choose to avoid working under a corrupt system. He suggests that this may be due to a lack of respect for a corrupt organization. One final way in which corruption can negatively affect growth relates to public finance. Since the World Bank and International Monetary Fund are trying to discourage corruption, they have made it harder for corrupt governments to get funds that they want. The two organizations want to see reductions in or the elimination of corruption before they will loan to a country, so countries with high levels of corruption may lose loans that would help their economic growth due to corruption (Fréchette 2006).

Fréchette's (2006) study provides some interesting results which differ from previous results. He finds that corruption increases as income increases, as rents increase,

and as education increases. He also finds that increasing political freedom decreases corruption. These results do not all seem intuitive and the contradiction between his results and previous results show that corruption is not completely understood and there is much room for investigation where it is concerned. The theoretical explanations of how corruption can negatively influence economic growth are detailed and very helpful. They provide stepping stones to understand other research which has been done on the relationship between corruption and economic growth.

In their paper, Durry, Krieckhaus, and Lusztig (2006) discuss the effects of corruption on economic growth, but add in another dimension: democracy. Democracy indirectly affects economic growth in different ways, one of which is by decreasing corruption and its effects. The authors define corruption "as the abuse of public office for private gain" and give some examples of corrupt behavior: "bribery, nepotism, theft, and other misappropriation of public resources" (Drury et al. 2006, 122). One way in which corruption slows down growth is that it decreases the amount of investment in the private sector of a country because of transactions costs associated with investing. Money may be used in inefficient ways when it is spent on bribes and other corrupt activities, leaving less money for productive uses (Drury et al. 2006).

The authors also discuss the other side of the argument, that corruption may actually be beneficial to economic growth in certain nations. There have been situations in which dictatorships have led to economic growth within that country, possibly because they are more efficient than previous governments even though they are corrupt. Overall, this idea is not as commonly accepted as the idea that it harms economic growth, but it is important to note because the direction of the effects of corruption on economic growth

are not completely agreed upon by economists. Drury et al. (2006) point out a flaw with the argument that corruption helps economic growth. They state that "most of those arguing the benefits of corruption regularly point out that it is not the ideal, but perhaps better than a rigid, inefficient bureaucracy" (Drury et al. 2006, 123-124). Because of this fact, Drury et al. (2006) expect that the effect of corruption on economic growth will be negative overall.

The authors' discussion of democracy and its relation to corruption and economic growth is very interesting because they give many different explanations why democracies help and hurt economic growth. For example, democracies can help growth because they take poor leaders out of positions of power and they give people a sense of security that makes them more likely to work, save, and invest. On the other hand, they tend to have high levels of government spending which can leave less money for investment and harm economic growth. Also, there is a possibility for political inefficiency within a democracy which therefore harms growth (Drury et al. 2006).

These two opposing theories and explanations are interesting to consider, but the authors state that "the more recent empirical literature suggests that neither perspective is accurate, or perhaps both are accurate and they balance each other out" (Drury et al. 2006, 125). They state that newer studies show that democracy does not have a significant effect on economic growth in either direction. The important fact to note is that this means that there is no direct effect, but there are indirect effects that democracy has on other areas, which, in turn, help growth. Drury et al. (2006) mention two common examples of indirect effects: education and health. Democracies tend to encourage spending on education and health, and both of these improve economic growth. What the

authors add to this idea is that democracy might have effects on corruption which then indirectly affect growth. They state that democracy allows the residents of a country to elect leaders who are not corrupt and eliminate ones who are which could, in turn, improve economic growth. The importance of this is that democracy decreases corruption overall, but also corruption within a democracy has a lesser effect on economic growth than corruption in a non-democratic system (Drury et al. 2006).

The authors study one hundred countries over the period of 1982 to 1997 using a time-series cross-section. The authors estimate a model with growth of GDP as the dependent variable and the International Country Risk Guide's measurement of corruption plus six additional control variables as the explanatory variables. Their results support the authors' hypothesis, that corruption does harm economic growth, but only in certain political situations. It harms growth in non-democratic or authoritarian countries but in democratic regimes it does not have a negative effect on economic growth.

There exists within countries a multitude of institutions that can have varying effects on many aspects of public life, including economic growth. Barro (1996) explains that institutions that relate to the strength of property rights have a significant effect on economic growth. Interestingly, he finds that when the existence and strength of property rights are taken into account, political instability does not have a significant effect on economic growth. This study includes proxies for both of these variables to see the effects that each has on economic growth. In his paper, Barro (1996) gives a worthwhile example of how poor property rights could be an explanation for low economic growth in certain countries. There are many countries that have extensive natural resources yet have not done well in the area of economic growth. These countries generally do not have

strong property rights and the natural resources are considered more like common property. This lack of strong property rights on these resources could explain the lack of economic growth seen in these countries. He also explains that there is empirical evidence that strong property rights can improve growth and investment within a country (Barro 1996).

Zak (2002) also argues that the specific institutions that protect property rights positively affect economic growth within a country. He explains that this could be because they "reduce the transaction costs and uncertainty which arise in exchange" (Zak 2002, 55). He adds that this concept is growing increasingly more important since the concept of property and property rights now includes ideas and intellectual property, which is much harder to protect yet often much more important. His study concludes that in countries where property rights are not enforced properly or to the fullest extent, the economic growth of that country is harmed. He also discusses his finding that poorer countries that do not enforce property rights well can become stuck in a "poverty trap" (Zak 2002, 67). Overall, his study finds that when countries have policies that encourage their society to respect and maintain property rights, this supports growth within that country (Zak 2002). This shows that strong enforcement of property rights is an important factor in determining economic growth.

2.3 Effect of Economic Factors on Economic Growth

The relationship between income inequality in a country and its economic growth has been studied by people in various fields. Within the field of economics, there are differing opinions and theories about what effect income inequality has on growth, if it

has a significant effect at all. Panizza (2002) describes these conflicting results in his paper, as well as contributing his own results. He explains that many cross country studies find that income inequality harms economic growth but studies that use panel estimations find the exact opposite result, that income inequality helps economic growth. There have also been conflicting results among studies that focus on the United States of America. Of studies that look at cross-state information, one that measured inequality using the income share of the third quintile of the population found that inequality hurt economic growth overall whereas the one that used the Gini index to measure income inequality came up with the opposite result. This clearly shows that the effect that income inequality has on economic growth is not completely understood or agreed upon by economists and that the method used to measure it can change the results drastically.

Panizza (2002) reports that although there are many discrepancies, the majority of empirical studies that look at the relationship between income inequality and economic growth at the cross country level find it to be negative. He suggests that the main issue with these studies that leads to the conflicting results is the "quality and comparability of the inequality data" (Panizza 2002, 26). There are many ways to measure income inequality and none of them are ideal. Also, the availability of data that can be used to study income inequality is limited for many countries which therefore limits the accuracy of these studies.

Panizza (2002) studies the relationship between income inequality and economic growth among the forty-eight continental states of the United States of America. He finds some support of a negative relationship between the two, although it is not a robust relationship. He uses both cross-state data and panel data to see if the results are different,

as has been found in previous studies. He does not find any proof that income inequality affects economic growth in a positive way. His study also finds that the effect that income inequality has on economic growth in the United States is smaller than the effect that it has in cross country studies. An extremely important point that he makes in this paper is that the data and the econometric techniques used can lead to different conclusions of the relationship. He proposes that the use of regional data could possibly resolve this problem. This thesis includes three different measures of income inequality to test whether the results are merely based on the data used or whether the results are consistent with different measures as well as regional dummies.

Dahan and Tsiddon (1998) present a different theory about the way in which income distribution relates to the economic growth of a country. The authors discuss a dynamic process that relates the demographics of a country to their income distribution to their economic growth. According to this theory, fertility and income distribution do not have a linear relationship with economic growth, but rather follow the shape of an inverted U during the course of economic growth and development of a country. This theory looks at income distribution and economic growth over the long run of the history of the countries rather than year to year fluctuations. It argues that as a country first begins to develop and increase its economic growth, fertility increases and there is more income inequality in that country. Then, once that country reaches a certain turning point in its economic development, when the economic growth of that country continues to increase the fertility rate decreases, as does income inequality.

The authors base this theory on two main ideas. They believe that the "net return to education of the child of an educated parent is higher than the net return to the

education of the child of the uneducated parent, and the costs of raising children are measured in terms of parents' forgone earnings" (Dahan and Tsiddon 1998, 29). This therefore categorizes children as a normal good and parents with a higher level of education have fewer children than parents with less education. At first, the uneducated population increases at a fast rate, remains uneducated, continues to have high fertility rates, and therefore "the supply of uneducated individuals increases faster than the supply of educated individuals" (Dahan and Tsiddon 1998, 29). This increase in supply of uneducated versus educated people makes the return to education even higher, which makes income inequality even higher as well. After a certain point, some of the poor, uneducated people decide to invest in education and have fewer children. This is why after this specific point in a country's economic development, the fertility rate and the amount of income inequality decrease in that country. This argument is very interesting, especially when comparing countries in different stages of economic development. Since it describes patterns of education and income inequality over a very long period of time (the modern history of a country), it is not as relevant for studying the effects of income inequality on economic growth over shorter, more recent periods of time. This theory relating fertility rate and income inequality to the point in development of a country can still be used to explain some differences that are found between more developed and less developed regions of the world with regard to income inequality and economic growth.

Breen (1997) discusses the relationship between inequality and economic growth, but he includes the concept of social mobility in the discussion. He introduces a very interesting paradox that exists between these three factors when specific theories are applied to their effects. There is a theory that income inequality in a country has positive

effects on economic growth because it provides incentives for people to work to improve their economic situation. Another common theory states that having social mobility within a nation will increase economic growth because it ensures that the nation's resources are being used in the best, most efficient ways. Another commonly believed idea is that a large amount of inequality within a country will reduce the amount of social mobility possible. Breen (1997) points out that "Thus there is a paradox: both inequality and mobility are good for growth, yet one militates against the other" (429).

The theory that inequality helps economic growth by providing incentives is a popular theory which is commonly used across multiple disciplines and can be seen in policy decisions. The idea behind it is that people want to maximize their individual utility, measured in money, which gives them incentives to work hard towards a higher salary. Along these same lines, there are theories which state that over time societies will grant positions to the people who are most eligible and capable of filling them because that is the most efficient way of assigning jobs. If this is true, then intelligence, education, training, experience, etc. will have a stronger effect on which people are chosen for which positions than characteristics which are ascriptive in nature, such as class, gender, and race (Breen 1997). This would be an example of a society with a high rate of social mobility among its members. This theory is idealistic and has not been proven using empirical studies; studies show that social mobility does not improve over time. Breen (1997) argues that social mobility does not have an effect on economic growth but that inequality does have an effect on it.

Similar to previous studies discussed, Breen (1997) uses a mathematical model to find that inequality in a country can negatively affect the economic growth of that

country. Even though it is true that inequality can give incentives to people and therefore improves efficiency, it also has the opposite effect on efficiency by "increasing the degree of inequality in inherited rewards, so that the individual's resources…come to depend more heavily on inherited rewards at the expense of ability (Breen 1997, 437). Overall, if two people have equal innate abilities but one comes from a disadvantaged family background while the other comes from a family with an advantaged background, they will find that they do not hold equal positions and that family background does play an important role in determining positions (Breen 1997). Therefore inequality among the people of a nation does not provide incentives to encourage the disadvantaged to improve their situation; family backgrounds may be important enough to prevent them from moving up, no matter the incentives. He concludes that increasing inequality can provide incentives which lead to an improvement in economic growth, but that this can have many exceptions and that there is a point at which too much inequality hurts economic growth. This is crucial policy-wise because it shows that policies which augment inequality with the goal of improving growth do not necessarily have that desired effect. Another very important result of his study is that if inequalities between genders and ethnic groups were lessened or eliminated, this would improve economic efficiency, implying that policies aimed at decreasing these ascriptive inequalities would be beneficial to the economic growth of countries.

2.4 Effect of Demographic Factors on Economic Growth

There are both ethical and economic arguments which promote equality with regard to demographic factors, but they are not completely agreed upon. Many argue that

improvements in gender and race equality ought to be made on an ethical basis. The effects on the economy and economic growth are less clear, however. Berik et al. (2009, 1) argue that "inequalities based on gender, race, ethnicity, and class undermine the ability to provision and expand capabilities." The authors state that the global economy, which has grown significantly in the recent decades, has increased income and wealth inequality. This has led to policy changes that interfere with goals of gender, racial, ethnic, and class equality. They use the perspective of feminist economics to discuss the ways in which gender equality would help economies overall, although empirical research on this is not all in accordance. They present policy suggestions to improve gender equality with the goal of "equality of opportunities" and "equality of outcomes." (Berik et al. 2009, 2.) This means that they not only believe that both genders deserve equal prospects for success, but that in the end, the equality of income and assets should be equal across groups. This does not mean that every member of each group is equal; rather it implies that certain groups are not disadvantaged compared to others (Berik et al. 2009)

The economics arguments relating gender equality to economic growth are not all in agreement with each other. The theoretical research shows two main theories: "gender inequality may stimulate some macroeconomic aggregates while having negative effects in other areas" (Berik et al. 2009, 13). The authors claim that the opposing results are caused by the different frameworks of the studies as well as different measures of inequality with regard to gender. Also, some studies focus more on short run causes and effects while others study the long run. Understanding which side of the argument is true is extremely important for economic and policy implications. The authors give relevant

research findings which support the argument that gender inequality is harmful to growth and therefore equality should be prioritized. They state that differences in education by gender lead to higher fertility rates and lower savings rates within a country. These two together can decrease the amount of money that is spent on the health and education of children within a country, which worsens the labor supply and productivity in the long run. Another reason that inequality can harm growth is that if boys are educated at a higher level than girls, this may be inefficient since boys who are less capable will have more resources devoted to their education while girls with greater potential receive insufficient educational resources. These theories of the effects of gender inequality on economic growth are the main foundation of the authors' argument for policies encouraging gender equality (Berik et al. 2009).

In addition to these theories, though, they discuss studies which have shown empirically that gender inequality is harmful to growth. One such cross country study found that countries where there is greater gender inequality among the work force have slower rates of economic growth. Another study shows that for certain countries, namely middle income countries, having higher levels of gender equality in education leads to more Foreign Direct Investment, although they point out that this could be caused by better labor productivity caused by educating women. The authors state that although increasing equality between genders would increase efficiency and fairness, there are reasons why it is not being encouraged as much as it should be. They claim that although it may have positive effects in the long run, it may have negative effects in the short run, making it unattractive to many people (Berik et al. 2009).

As far as specific policies are concerned, it can be rather complicated to make generalizations about policies that will improve gender equality in such a way as to improve growth while causing as little harm to it as possible. The authors state that "Achieving equitable development requires full employment, jobs at decent wages, the ability of people to combine paid with unpaid work, and the equitable distribution between men and women of paid work opportunities and unpaid work responsibilities" (Berik et al. 2009, 19). These goals are not easily attained, however. They suggest that policies that give incentives toward better productivity and better wages is one way to complete the goal. Another policy, with regard to industries, is one that increases the productivity of labor in order to improve working conditions. Also, programs that reduce segregation by gender within the work place, such as affirmative action programs and informational programs, could have an impact. The authors claim that for these goals to be realistic, the World Trade Organization, the International Monetary Fund, and the World Bank would have to change some of their rules and regulations in order to allow countries to promote equality and eradication of poverty within their countries rather than "maximizing the global volume of trade" (Berik et al. 2009, 20). These policy suggestions are very broad and would require major changes; therefore they would be very difficult to enact.

Klasen et al. (2009) also discuss gender inequality and its effects, but their paper provides more empirical evidence proving that gender inequality is harmful to economic growth and should therefore be eradicated for economic reasons rather than simply reasons based on equality. They use panel and cross country regressions to study how gender inequality, specifically in education and employment, affect economic growth.

They find that both of these factors have a significant negative impact on economic growth throughout the world. The main theoretical reasons that the authors provide to explain why gender equality improves economic growth are: it increases human capital and does not exclude capable females from the work force, helping economic performance; it has positive externalities on society with regard to education of females; it makes a country more competitive on an international level, especially within exports; it gives women more "bargaining power" in their families; and some studies have found that women have a lower tendency for corruption and nepotism than men (Klasen 2009, 93-95).

The authors cite multiple empirical studies, including their own, which conclude that equality between genders has a positive effect on economic growth, although there are limitations to many of the studies due to data availability. There is much more empirical evidence showing that gender inequality in education harms economic growth than gender inequality in employment harms economic growth. In their own empirical analysis, the authors find evidence that gender inequality in both education and employment have negative effects on economic growth within a country. They state, "The costs of discrimination toward women in education and employment not only harm the women concerned but also impose a cost for the entire society" (Klasen et al. 2009, 117). This argues for the importance of policies promoting gender equality in countries throughout the world in order to improve economic growth. Klasen et al. (2009) suggest that policies that encourage the education and employment of women are necessary.

In addition to inequality between genders and its effect on economic growth, inequality between races and ethnicities is another key topic in studying growth. Alesina

and La Ferrara (2005) give examples of cases where racial variety seems to help growth and of cases where it seems to harm growth. They mention New York City and Los Angeles as cities with high racial diversity and high levels of problems with racial relationships, yet both cities are very successful economically. On the other hand, in Africa there are many conflicts between races and ethnicities and they have seen low levels of economic growth. The authors posit the question of whether race and ethnicity have anything to do with the economic success and failures of these areas. Theoretically there are many possible negative consequences of diversity including "conflict of preferences, racism, and prejudices [which] often lead to policies that are at the same time odious and counterproductive for society as a whole" (Alesina and La Ferrara 2005, 762). Alesina and La Ferrara's (2005) paper studies communities within countries as well as cross country analyses; this thesis will focus on the cross country analyses.

Although societies which are fragmented tend to have worse policy management and face distinct challenges from homogenous societies, many diverse societies are economically successful. The authors use a theoretical outline which states that there are potential positive outcomes to production, innovation, and ingenuity which can come from having an ethnically diverse population. They state that "a diverse ethnic mix also brings about variety in abilities, experiences, and cultures" which can improve the level of production or amount of creativity within a society. Having a multitude of groups gives each group the opportunity to do what they do best, while still having a variety. This can only work if these groups can synthesize together to improve productivity. In contrast, preferences might vary between different ethnic groups making the utility from public goods decrease. One possible reason that the effects of racial diversity are not

completely consistent is that ethnic diversity may be advantageous in more developed countries. It is also possible that more developed countries with more resources have more policies and institutions to handle problems caused by diversity and therefore are more open to reaping the benefits of it, rather than suffering any negative consequences (Alesina and La Ferrara 2005).

Racial diversity affects economic growth and performance for many reasons. Alesina and La Ferrara (2005) discuss some of the possible reasons behind the relationship. They state that individual preferences are often determined by group patterns and preferences, so people belonging to a specific ethnic group will have preferences similar to other members of that group. Also, people's strategies may be strongly affected by race because it may be more efficient for them to give preference to other people within their ethnic group, especially when there are failures within markets. Lastly, they explain that people of different ethnic groups have different skills, abilities, and methods with regard to production. Therefore, having a more diverse workforce can improve problem solving and productivity because there are people who think about problems in different ways and from different angles. They state that, "under certain conditions, a more diverse group of people with limited abilities can outperform a more homogeneous group of high-ability problem solvers" mainly because of the multiple perspectives gained by having a variety of ethnicities (Alesina and La Ferrara 2005, 766). Although ethnic diversity can lead to problems with communication, studies have found that, controlling for this productivity is higher when diversity is higher. The results about diversity are rather complicated, but overall it seems that ethnic diversity has many

positive effects on economic growth in wealthier countries but that these positive effects may be negated by the negative ones in poorer countries (Alesina and La Ferrara 2005).

Another demographic factor that can affect economic growth is the level of social mobility within a country. Social mobility within a society is the concept of the degree to which a person can change his or her status within the society. Intra-generational mobility refers to the extent to which a person can change his/her social status within his/her lifetime, whereas intergenerational mobility refers to the extent to which a person can change his/her social status from that of his/her parents. If a country has high levels of social mobility, it means that it is possible and relatively easy to change status and vice versa. Many studies, such as those done by the OECD, tend to focus on intergenerational mobility and the term "social mobility" will henceforth refer to intergenerational social mobility in this paper (d'Addio 2007).

Social mobility can be rather complicated to study, but it is important because it can have many effects on society as a whole and on the economy of the society. According to d'Addio (2007), there are three main reasons for the importance of intergenerational mobility. First, the social welfare of the people of the country as a whole can be affected by the allocation of wealth and assets among different generations of people. Second, more social mobility within a country can decrease the amount of inequality, in economic terms. The better level of equity within the country, can improve the allocation of resources because people have more hopes and aspirations of moving up, no matter their social background. Third, it can improve the economic efficiency within a country. A high level of social mobility enables able and talented people, no matter their background, to attain positions for which their talents are suited. On the other

hand, low rates of social mobility, may prevent intelligent and able people from attaining the jobs that they are capable of, which would be a waste and reduce the overall economic efficiency (d'Addio 2007). The author does not claim that there is necessarily one ideal value for social mobility, but she stresses that its effects are important and if they are understood, policies can be aimed at improving social mobility to a point that is deemed best for society.

Intergenerational social mobility and policies can theoretically have an effect on economic growth. An article released by the OECD discusses social mobility, its effects, and policies to improve it across the world. According to the article, "Policy reform can remove obstacles to intergenerational social mobility and thereby promote equality of opportunities across individuals. Such reform will also enhance economic growth by allocating human resources to their best use" (OECD 2010, 183). They study the level of social mobility across the OECD countries that have enough data to make it possible and discuss possible policy reforms. They define intergenerational social mobility as "the relationship between the socioeconomic status of parents and the status their children will attain as adults" or "the extent to which individuals move up (or down) the social ladder compared with their parents" (OECD 2010, 184). If a society has low levels of social mobility, or is immobile, people's levels of education, income, and type of occupation are strongly tied to their parents' levels of education, income, and type of occupation, whereas they are less tied to and influenced by factors from their parents and are more attributable to individual characteristics (OECD 2010).

There are many factors which explain the relationship between the success of the parent and the success of the child. Some of these factors are more controllable than

others and some are more easily measured than others. For example, some of the similarities between parents and children could come from inherited traits which relate to natural abilities, such as intelligence. Other factors could include the social environment created by the family and community which a person grows up and is shaped in. Many of these factors are determined by individual families, but others can be influenced, some strongly, by policies set forth by the government. Some factors which are somewhat affected by policies are "environmental factors…such as social norms, work ethics, attitude towards risk and social networks" (OECD 2010, 184). Policies that have a more significant effect on social mobility are those that "shape access to human capital formation, such as public support for early childhood, primary, secondary, and tertiary education, as well as redistributive policies (e.g. tax and transfer schemes) that may reduce or raise financial and other barriers to accessing higher education" (OECD 2010, 184). Understanding the importance of social mobility and which policies can affect it can help countries improve their levels of social mobility in an attempt to increase economic efficiency and economic growth.

There are arguments of both equity and efficiency for using policies to make social mobility more possible within a country. Equity wise, having more social mobility should decrease the amount of income inequality among the people. Increasing social mobility would make an economy more efficient because it would lead to a better allocation of human capital into the available positions. Also, when a society is more mobile and people know that there are opportunities for them to move up and succeed in life, they may have more incentive to work hard for this goal. Conversely, societies with less social mobility "are more likely to waste or misallocate human skills and

talents…[and] lack of equal opportunity may affect the motivation, effort and, ultimately, the productivity of citizens, with adverse effects on the overall efficiency and the growth potential of the economy" (OECD 2010, 184). Some of these policies, which involve spending government money on programs such as early education, can cost the government money in the short run, but in the long run they can lead to growth. Although improving the social mobility within a country can be an extremely important consideration for growth, having complete social mobility is not necessarily ideal either. Some policies which could be used to increase mobility would have negative effects on total output. For example, moving to a more progressive tax system may increase social mobility, but it may have a negative effect on labor and productivity. There is no precise amount of social mobility which is ideal so countries must choose a level which works for them, where they reap the benefits of having a mobile society but where the negative side effects do not outweigh them (OECD 2010).

The results of the OECD study of social mobility across countries provide a great deal of information about social mobility levels, their causes, and policies that could be used to improve them, but the number of countries studied is limited. The study compares the education, occupation, socioeconomic status, and earnings of parents with those of their children and this data is only available for a small set of countries. Using the available data, they determine that for every country studied, the background of the parents does have an effect on the socioeconomic status of the children. With regard to earnings, mobility is relatively high in Australia, Canada, and Nordic countries while it is relatively low in France, Italy, the United Kingdom, and the United States. Another important relationship that they discuss is that children of parents who are well educated

have significantly higher wages than children of uneducated parents. There are also strong connections between the level of education of the parents and the level of education of the children. Overall, they discuss the fact that education can have a huge impact on social mobility and therefore policies regarding education can increase mobility. They found that in countries where more young children are enrolled in school, the relationship between a parent's background and their child's success is weaker. This means that giving all children an equal opportunity for education from a young age can be an influential factor in their lives. They also found that "redistributive and income support policies" are connected to higher levels of social mobility, so that is another policy option for improving social mobility (OECD 2010).

The number of countries which have data that spans multiple generations is very low, which makes it very challenging to study social mobility at the global level. The sample would be too small and therefore the results would not be as reliable if it were included in this study. Social mobility will not be included in the empirical part of this study. The concept of social mobility is still extremely important in relation to economic growth and is therefore still discussed.

2.5 Conclusion

It is clear that economic growth is a complex and crucially important piece of macroeconomics when looking at the country level as well as the world level. Because of its many implications, understanding which factors affect economic growth, the magnitude of their effects, and the directionality of their effects can provide economists, politicians, social workers, and others with useful information to improve economic

growth. There are many different theories of economic growth and countless factors affecting growth in a multitude of ways. From this, a number of concepts that have been theorized and/or proved to better understand growth throughout the world.

The main factors that have been proven to affect economic growth and are generally accepted by economists as being important factors include human capital, investment, and technology. These variables have been discussed and are included in this study as control variables. The effects of political instability and property rights on economic growth have also been studied, although not to the same extent as the aforementioned variables. Experts who have studied them agree on their effects on economic growth, but they are not as elemental to basic explanations of economic growth. The other variables discussed above have been studied by economists, but the results are not as conclusive. Income inequality, corruption, ethnic diversity, and gender equality are very interesting to study as their effects on economic growth are less well understood and economists are either unsure or in disagreement as to what influence they have.

This study will focus especially on income inequality because it is not very well understood, yet is a very important part of society that pertains to equity as well. All of the other factors mentioned will be studied as well, but because their effects are more generally agreed upon or understood, this study will not concentrate on them to the same extent.

Income inequality, the focus of this study, is concerned with the questions of equality, opportunities, politics, cultural issues, and societal issues for the members of society. Understanding how it affects economic growth could have significant policy

implications. For example, if a reduction of income inequality in a country can be shown to improve economic growth, countries would have more incentives to reduce income inequality through tax codes, laws, etc. This variable is complex and this study aims to add to the knowledge about it within the context of its effect on economic growth.

CHAPTER 3

Estimating the Factors Affecting Economic Growth

This chapter presents the research question and outlines the methodology used in determining the effects of the different factors on economic growth. It presents the main equation used in the regression analysis and the rationale for including case studies in this thesis.

The purpose of this study is to determine factors that explain the variation in growth rates across countries. It focuses on the effects of specific variables, principally those discussed in Chapter 2. This thesis utilizes regression analysis and case studies to explain factors of economic growth. The dependent variable in the model is the average growth rate over a five year period. The independent variables are measured at the beginning of this five year period. This distinction is important to this study for two reasons. The five year average growth rate, rather than simply the growth rate in a specific year, is used to address the issue of business cycles. Using the five year average for the dependent variable and the initial values for the independent variables prevents issues with causality in the results; since the dependent variable represents a time period after the independent variables, the causality can only run in one direction.

The main factors that affect economic growth which are studied in this thesis can be divided into four main categories: basic, institutional, economic, and demographic. The category of "Basic" includes the proxies for the stock of human capital, capital stock, technology, and initial GDP. The "Institutional" factors are political stability, corruption, and property rights. The "Economic" factor is economic inequality. The "Demographic" factors are ethnic diversity and gender equality. (These variables are discussed in detail in

Chapter 4). The main research question is how do the basic, institutional, economic, and demographic factors affect economic growth in countries throughout the world? The empirical equation includes the broad categories that affect economic growth. When the models are run, the variables within each category will be run in different combinations. Since some factors have multiple proxies to represent them and since there are high correlations between certain variables, all of the variables cannot be run in one equation. The models will all be variations of the following equation:

$$Av5YrGDP = \beta_0 + \beta_1 Basic_{initial\ year} + \beta_2 Institutional_{initial\ year} + \beta_3 Economic_{initial\ year} + B_4 Demographic_{initial\ year} + \varepsilon$$

This paper hypothesizes that income inequality will have an effect on the economic growth in countries throughout the world, but its directionality is indeterminate because existing evidence on how income inequality affects growth is inconclusive. The results depend on whether one uses a cross-section single equation estimation or panel estimation. Also, the full effect of income inequality cannot be captured by numbers and in equations. Human capital, education, investment, and technology will all have positive effects on economic growth, following the literature of theories and previous studies. Corruption within a country will harm economic growth since most economists agree that it does. Stronger property rights and political stability will help growth based on previous literature. Gender equality and ethnic diversity are less well understood, but this paper follows the previous studies and hypothesizes that they will both help economic growth. A lower initial GDP will lead to higher economic growth rates following the concept of convergence.

This thesis uses ordinary least squares (OLS) regression analysis and case studies to determine factors affecting growth. The data set is analyzed using the program Gretl. Some models include time dummies for the different years, some include regional dummies, and some models do not utilize dummies at all. The results of the different models are compared. Due to limited availability of data, country-specific case studies are included to complement the regression results. China and Argentina are chosen for several reasons. Both countries currently struggle with income inequality and there is ample literature on their level of inequality, its effect on the people, and how they are dealing with it. China and Argentina are in two different regions of the world and have very different histories, economically and otherwise. The regression analysis only shows one aspect of income inequality and these case studies attempt to add another layer to this discussion.

CHAPTER 4

Variables and Data Set

This chapter presents the variables used in this study, the data sources, and the compilation of the sample. It discusses the sample as a whole and includes descriptive statistics about the sample for additional information.

4.1 Data Sources and Variable Definitions

The data used in this study was gathered from multiple sources. These sources are (1) World Development Indicators & Global Development Finance Report (WDI), published by the World Bank; (2) Worldwide Governance Indicators Project 2011 (WGI), also published by the World Bank; (3) the World Factbook, published by the United States Central Intelligence Agency; (4) the Penn World Table (PWT); (5) the Corruption Perceptions Index (CPI); (6) the Educational Attainment Dataset, published by Barro and Lee; and (7) Human Development Reports (HDR), published by the United Nations Development Programme.

Many of the important pieces of data come from the WDI, including the dependent variable. The dependent variable (***Av5YrGDP***) is the average of the per capita GDP growth rates within a country over a five year period, as a percentage. All of the independent variables' observations for the year 2000 have data from the year 2000 but the dependent variable is the average per capita real GDP growth rate for the years 2000-2004. Likewise, the independent variable's observations for 2005 contain data from 2005 but the dependent variable is the average per capita real GDP growth rate for 2005-2009. Using *average* of the per capita growth rate of the GDP over the following five years is

very important to this study; one reason is to control for business cycles. Since countries go through business cycles where growth rates fluctuate, using the average growth rate ensures that this variable captures overall growth attributable to the independent variables rather than to the business cycle. It is essentially used to control for the business cycles and reflect long term growth within the countries, which is affected by the independent variables, rather than short term growth, which is affected by business cycles.

Defining the dependent and independent variables this way also controls for the issue of reverse causality. For certain factors, there is a question as to which direction the causality runs. For example, does having higher levels of education increase the economic growth or does an increase in economic growth increase the levels of education within a country? In order to make certain that the independent variables are the ones affecting the dependent variables and that reverse causality is not an issue, the time period of the dependent variable is the five years following the independent variables. Following the previous example, if education levels are improved within a country, that could lead to the average growth rate for the next five years improving, but one could not argue that the average growth rate for the following five years affects the level of education in the starting year. This method of using the average growth rate over a period of time as the dependent variable and independent variables from the initial year is a main factor in Barro's (1991) paper, "Economic Growth in a Cross Section of Countries," and this article was used as a basis for the dependent variable in this thesis, although the model is different and the time periods differ in length.

The variables that are included to represent the "basic" factors of economic growth come from a variety of sources. One aspect of the "basic" factors is the stock of

human capital, which is represented by a proxy. Although it is not perfect, the education level of the population is a good proxy for the stock of human capital. The variable (***EduTertiary***) is the percentage of people age twenty-five and older who have completed their tertiary education and the data comes from the Educational Attainment Dataset. Capital stock is measured in this study using the proxy of investment (***Investment2***) which is calculated based on data in the PWT. Since the PWT does not contain the plain data for investment, it had to be calculated based on available data. The "PPP Converted GDP Per Capita (Laspeyres), derived from growth rates of c, g, i, at 2005 constant prices" which is in 2005 International dollars per person was multiplied by the "Investment Share of PPP Converted GDP Per Capita at 2005 constant prices [rgdpl]," which is in percent.[1] The product, Investment2, is the investment per capita in 2005 constant international dollars.

Two different proxies are used to represent technology, both of which come from the WDI. The first proxy is internet users per one hundred people (***Internet***). The second proxy for technology is the annual number of patent applications by residents of the country (***Patents***).[2] Using the patent applications as a proxy for technology is logical since patents give property rights to inventors and innovators for new ideas, showing an increase in technology. The variable GDP per capita in constant 2000 US dollars (***GDP2000US***) is an important control variable for the model which represents initial GDP and comes from the WDI. This variable is included to control for differences in GDP growth due to convergence or the catch-up theory.

[1] These data were expressed as percentages, so they all had to be divided be 100 to make them fractional.

[2] Internet may positively or negatively affect economic growth but it is expected that Patents will positively affect economic growth.

The next group of factors included in the model is comprised of the "institutional" factors which affect economic growth. The WGI provided the data for the variable representing political stability (***PoliStab(WGI)***) and one of the variables representing corruption (***Corruption(WGI)***). Political stability is measured as political stability and absence of violence/terrorism. The corruption variable is actually measured as control of corruption. For both of these variables, the values range from about -2.5 to 2.5[3] with higher values corresponding to better governance outcomes (meaning more political stability and better control of corruption, i.e. less corruption). These variables were taken directly from the WGI, where they were compiled and calculated based on many different factors. A second measure of corruption from a different source is also used as a check of the accuracy of the results. The second measure of corruption (***Corruption CPI***) is compiled and calculated by Transparency International, based on the *perceptions* of corruption within each country. The values range from zero to ten; lower numbers signify high levels of corruption and higher numbers indicate low levels of corruption. The variable property rights (***PropRights***) comes from the WDI. A proxy, time to enforce a contract in days, is used to represent the strength of property rights within a country.

There is only one factor within the category of "economic" factors in this thesis, income inequality, but three proxies are used to represent this factor. All three of the proxies used to represent it come from the WDI. The first proxy for income inequality is the GINI index (***GINI***), which theoretically ranges from zero to one hundred with zero representing perfect equality and one hundred representing maximum inequality within

[3] The authors describe the results as ranging from "about -2.5 to 2.5" but there are many observations that are above and below this range.

the country. It is defined in the WDI (2011) as "measure[ing] the extent to which the distribution of income (or, in some cases, consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution. A Lorenz curve plots the cumulative percentages of total income received against the cumulative number of recipients, starting with the poorest individual or household. The Gini index measures the area between the Lorenz curve and a hypothetical line of absolute equality, expressed as a percentage of the maximum area under the line." The second measure of income inequality (***IncmIneq2***) was calculated from data in the WDI and is defined as the income share held by the top 10% of the country divided by the income share held by the bottom 10% of the country. The third measure of income inequality (***IncmIneq3***) was also calculated using data from the WDI and is defined as income share held by middle class (defined as the middle 60% of population).

The category of "demographic" factors includes variables for ethnic diversity and gender equality. A variable to represent social mobility could not be included due to the lack of available data. The variable ethnic diversity (***Ethnic***) uses data from the CIA World Factbook. The variable is defined as the percentage of the population that the largest ethnic group in the country occupies. This information is not available over a period of time so the same data is used for both 2000 and 2005. Since the data was collected by individual countries and then gathered and presented by the CIA World Factbook, different countries could have measured it slightly different ways. The gender equality (***Gender(GEM)***) data was taken from the HDR's Gender Empowerment Measure (GEM) which is calculated to represent how much power women have in a

given country, especially in the job market and public offices. The values range from zero to one and higher numbers correspond with higher levels of gender equality.

In addition to these variables, regional dummy variables were created to test whether the geographic regions of the countries have an effect on economic growth. Each of the countries within the data set is categorized into one of seven regions (1 = East Asia & Pacific, 2 = Europe & Central Asia, 3 = Latin America & Caribbean, 4 = Middle East & North Africa, 5 = North America, 6 = South Asia, 7 = Sub-Saharan Africa). These are the regional classifications assigned to countries in the WDI dataset. In order to keep the variable discreet, only the number representing each region is used in the data set. To avoid the dummy trap, regional dummy variables were only created for regions 2-7, therefore all of the results of the regional dummies are compared against region 1, East Asia & Pacific.

The original data collected consisted of 189 countries from all regions of the world over the period of 1997 to 2009. The only countries not included at this point were countries for which there was virtually no information. There were many holes in this data set, including data for the main variables tested. In order to solve this problem, and to make the data a better measurement for the variables in this study, this data set was patched and condensed. Since the final data set needed to include as much information as possible for 2000 and 2005 for as many countries as possible, data was patched into observations for 2000 and 2005. If an observation already had data for one of those years, it was left as is, but if it was missing any, then data from other years was patched in. Data from 1997-2002 was used to patch the year 2000 observations and data from 2003-2009 was used to patch the year 2005 observations. The piece of data that was from the closest

year was selected. If two pieces of data were equidistant from the hole, the earlier piece of data was used. All of the data except for the patched 2000 and 2005 data were removed. Finally, since there are certain variables that are run in all models, observations that were missing data for those variables were removed as well. This left 178 observations from 114 unique countries, the maximum number of countries included in any model. These are the observations included in the Descriptive Statistics. Although there are fewer holes in this data set than there were in the original data set, it is still not complete, meaning that different models contain slightly different numbers of observations based on which additional variables are in them.[4]

4.2 A Discussion of Descriptive Statistics[5]

Table 1 (page # 84) presents descriptive statistics of the data which point to some interesting information about the data set as well as giving a general idea about each of variables within the study. The dependent variable, Av5YrGDP, has a median of 3.02, which is a promisingly high rate of economic growth. Additionally, relatively few observations (11 out of the 178) have a negative average growth rate over the five year period. The range between the minimum and the maximum growth rates is rather high; the country with the lowest Av5YrGDP, Cote d'Ivoire, had an average growth rate of -2.70% from 2000-2004 while the country with the highest Av5YrGDP, Armenia, had an

[4] Gretl skips observations with missing data, so for each model, only the observations which have complete data for all variables included in that model are run.

[5] A list of these observations (countries, years, regions, and GINI coefficients) can be found in Appendix 1. The descriptive statistics were calculated by Excel.

average growth rate of 10.84% from 2000-2004. (China's growth rate from 2000-2004 is very close to the maximum at 10.80%.)

Since EduTertiary is the measure of the percentage of the population over 25 with a tertiary education, the percentages are much lower than other measures of education, such as primary education, would be. The maximum percentage is 30.6%, in the United States in 2000. The low mean (7.14%) and median (5.85%) show that there are many more countries with low values rather than high value close to the maximum. In the raw data, 131 of the 178 observations were below 10%. The minimum of 0.1% is an extremely low number, meaning that in Guyana in 2000 only one out of every thousand people has a tertiary education.

There is a large range for Investment2, from $21.79 per capita to $37,752 per capita. Cote d'Ivoire 2000 has the lowest level of investment as well as the lowest average growth rate. The maximum value belongs to Qatar in 2005. This value is extremely high compared to other values in the data set. There are only three values over ten thousand dollars, and the two others (Singapore and Luxembourg) are in the ten thousand dollar range.[6] These three countries have relatively low populations, so this could explain why they are the three with the highest *per capita* investment. For reference, the United States has an investment per capita of $9768.86 while also having a much higher population. There is also a large difference between the mean and the median for Investment2. The median of $1,065.61 is lower than the mean of $2,193.50

[6] Some of the observations that were omitted due to lack of data for other variables also have Investment2 values in the ten thousand dollar range, but they are all lower than Qatar, Singapore and Luxembourg.

which shows that the majority of the values are less than the mean; this could be due to the relatively small number of observations with extremely high levels of investment.

The variable of internet users per 100 people has a relatively high range and standard deviation as well as a large difference between the mean and the median. The minimum value is 0.03 internet users per 100 people, meaning that only 30 out of every 100,000 people in Liberia had access to the internet. Since the internet is a relatively new technology, it is interesting to note that the minimum value comes from 2005, rather than 2000 as would be expected. The highest value is 61.5 per 100 people in Estonia in 2005.[7] These values seem relatively low, but they have probably increased greatly since 2005 with the development of the internet. The other measure of technology, number of patent applications, also has an extremely large range. Malawi (2000) and Uganda (2005) each only reported three patent applications by residents while the United States reported 164,795 in 2000. This data is somewhat limited, 117 observations, as many countries did not report this statistic, so models run with this variable are limited in their results.

The range of initial GDPs (GDP2000US) suggests a broad disparity in per capita real GDP through the world. The Democratic Republic of Congo had the lowest initial GDP, with a value of only $91.2 per capita in stark contrast with the maximum value of $46,457.9 per capita in Luxembourg (which also had very high investment). The much lower median ($1,575.2) shows that the majority of the values are less than the mean ($4,934.0), similar to the investment data.

[7] For the countries included in the descriptive statistics, Estonia has the maximum value, but there are many countries with higher values for Internet, especially in 2005. Most countries exhibit an increase in Internet from 2000-2005, but many observations from 2005 were omitted due to lack of data for the other variables.

Political stability ranges from about -2.5 to 2.5 by definition, but this data set includes values that are below the definition's minimum. The lower values refer to less political stability; Iraq had the lowest score of -2.72 in 2005 due to the war and the complex politics during that time. The most politically stable country is the Netherlands in 2000, with a value of 1.62. It is interesting that the minimum value is outside of the lower bound of the supposed range from the definition yet the maximum value is not close to the upper bound. Also, the mean value, -0.22, is negative, meaning that, on average, countries tend towards political instability.

Iraq in 2005, the country which is the least politically stable, is also the country with the most corruption (WGI measure), with a value of -1.46. Finland in 2000 has the best control of corruption with a score of 2.58. The mean and median are both negative, like political stability, but conversely to political stability, the minimum value is not close to the lower bound while the maximum value exceeds the upper bound. The second measure of corruption (CPI) has similar interpretations as the WGI measure; lower numbers mean more corruption and vice versa. The minimum value, 1.5 in the Ukraine in 2000, is the most corrupt country according to this measure. Iraq 2005, which is the most corrupt country according the WGI measure, ranks the 14th most corrupt in the CPI's measure. The country with the least corruption, according to CPI, is Finland 2000, with a perfect score of 10, matching the WGI's results. This similarity between the two measures points towards them both being good measures since they are in agreement.

The property rights variable has the least amount of information within the data set with only 84 observations, so it limits the models that it is included in somewhat. Since it represents the number of days required to enforce a contract, the range between

the minimum and the maximum is rather large. In Lithuania in 2005, it takes only 210 days (slightly less than seven months) to enforce a contract, whereas in Guatemala in 2005 it takes 1,459 days (almost four years) to enforce a contract.

The GINI coefficient can theoretically range from 0-100, but the actual range is not close to this theoretical range, meaning that no observation represents any value close to or exactly at perfect inequality or equality. The country with the minimum value, the least inequality, is Denmark in 2000 with a measure of 24.7. Interestingly, the four countries with the lowest inequality levels (Denmark, Sweden, Norway, and Finland) are geographically very close to each other. The observation with the maximum inequality is South Africa in 2005 at 67.4. In contrast with the countries with the lowest GINI values, the four countries with the worst inequality in the sample are spread throughout the world; they are South Africa, Maldives, Haiti, and Brazil. Although the values for the GINI coefficient do not actually range from 0-100, they could, which makes the mean of 41.12 interesting. Since it is lower than 50, the average level of inequality in the observations in this sample tends to be more equal than not, although a GINI of 41.12 is not necessarily ideal. For reference, the GINI coefficient for 2000 for the United States is 40.81, which is very close to the world average.

IncmIneq2 is the income share held by the top 10% of the country divided by the income share held by the bottom 10% of the country, so higher numbers mean more inequality within a country. The country with the highest IncmIneq2, Maldives in 2000, has a value of 100.18, meaning that the top 10% held approximately one hundred times the amount of income as the bottom 10%, an overwhelming difference. Finland had the minimum value in 2000 with 5.61. It was also one of the top four countries with the least

inequality using the GINI coefficient as a measure, showing that both measures are similar. For IncmIneq2, the mean and median are much closer to the minimum value than the maximum value, so there are many more low values than high values; of the 177 observations, 169 are below 50 and 129 are below 20. The final measure for income inequality, IncmIneq3 (income share held by the middle 60% of the population) shows many similarities to the GINI data. South Africa in 2005 has the highest level of inequality, with the middle class only holding 25.34% of the income. Denmark in 2000 has the least inequality according with the middle 60% of the population holding 55.86% of the income, which is very close to proportional (granted this does not reflect the amount of inequality within that 60%). This same observation has the least inequality according to the GINI coefficient, showing the similarities between the measures.

The GEM as a measure for gender equality shows the great disparity in women's rights throughout the world. The values can only possibly range from zero to one and the range within the data is not far from that range. This measure is the measure of empowerment of women and is based partially on women in office and women in high level jobs, so countries where this is socially unacceptable probably have very low values. The minimum value, 0.12, belongs to Republic of Yemen in 2005 and the maximum value, 0.83, belongs to Norway in 2000. The mean and the median values are very close together, so the data for GEM is probably rather evenly distributed through the dataset. The variable to represent ethnic diversity also has a very wide range of values. Since it is the percentage of the largest ethnic group within the country, the numbers have to be from 1-100 and they actually go from 15.5% - 99.7%. The country with the least ethnic diversity is Lethoso and the country with the most ethnic diversity is Nepal. The

mean and median are both in the range of 70-80% so the majority of the data lies to the right of the mean.

CHAPTER 5

Empirical Results and Case Studies

This chapter presents the empirical results of the study and explains their meaning and importance. It also contains two case studies of countries in order to show the importance of income inequality using examples from history.

5.1 Empirical Results

This thesis estimates several specifications for the growth model to determine whether the results are sensitive to proxy variables used. Certain variables (GINI, Investment2, EduTertiary, GDP2000US, and Internet) are fundamental aspects of economic growth and are therefore consistently included in all models. Some of the variables such as (GDP2000US and Corruption(WGI)) are highly correlated. These variables cannot be included in the same model due to multicollinearity. Other variables such as (Patents) have limited availability of data and are excluded from certain models to increase the number of observations. By and large, the results are not very sensitive to proxy variables, with the exception of regional dummy variables. The five models that best show the effects of the variables studied on economic growth are provided in Table 2 and additional models are included in Appendices 4-9.

Table 2 (page # 86) presents the most important and useful models run in the regression analysis which were selected out of all of the models run. There are many different possible combinations of variables and a variety of models was run based on the basic empirical equation presented in Chapter 3. The main models in Table 2 all contain certain variables in common, which were used in virtually all models run because of their

importance to this study. The variables that have been discussed in previous chapters which are not in the main models are left out because their results are either not significant or they are not important to the main discussion in this thesis. Additional models are discussed and are presented in the Appendices 4 through 9.

Model 1 is the most basic of the models and shows the effects that the main variables have on economic growth. It contains 117 observations in total from 78 unique countries.[8] The coefficient of the GINI index is negative and statistically significant different from zero at the 1% level. This result suggests that as income inequality increases, the average economic growth for the following five years decreases. Hence, income inequality hurts growth. The coefficient of -0.12 means that as GINI increases by one, holding all else constant, the average growth rate over the following five years decreases by 0.12 percentage points. The next variable in the model is Investment2, whose coefficient is not significant in this model, although it is in some other models.

The following variable, EduTertiary, is the proxy for human capital, and its coefficient is significant, although only at the 10% level. Since the coefficient for tertiary education is positive, this means that as the percentage of people over 25 with a tertiary degree within a country increases, so does the average economic growth for the following five years. As the percentage of people over 25 with a tertiary degree increases by 1%, the average economic growth for the following five years increases by 0.07 percentage points, holding all else constant. These variables behave as expected, since both education and human capital are known to improve economic growth within countries.

[8] A list of the observations included in this model, their regions, and their GINI coefficients can be found in Appendix 2.

GDP2000US's coefficient is significant at the 1% level and the coefficient is negative. As the initial GDP per capita of a country increases, the average economic growth for the next five years decreases, essentially meaning that richer countries grow at a slower growth rate in comparison to poorer countries supporting the convergence theory. As the initial GDP per capita of a country increases by $1 (in 2000 US dollars), the average growth for the next five years decreases by 0.0002 percentage points (or as the initial GDP per capita of a country increases by $10,000, the average growth for the next five years decreases by 2 percentage points), holding all else constant.

The next variable, Internet, is interesting. It is used as a proxy for technology, but with some caution because it is not a variable that was used in the previous literature referenced in this thesis. The coefficient is significant at the 1% level, but the coefficient is negative. This model shows that as the number of internet users per one hundred people increases by one, holding all else constant, the average economic growth for the following five years decreases by 0.05 percentage points. If internet were truly a valid proxy for technology, this would mean that as technology increases, economic growth decreases. This does not conform to the theories arguing that technology helps growth. Although the internet can be seen as a form of technology, it can also be a form of distraction. It is possible that this coefficient is negative because the internet distracts people and actually makes them less productive by providing them with diversions.

Since Internet does not seem to be a good proxy for technology, Patents is used, although it does reduce the number of observations in the model. It's coefficient significant at the 5% level and positive; as the number of patent applications by residents within a country increases by one, holding all else constant, average economic growth

over the following five years increases by 0.00002 percentage points. This number may seem rather low, but in the scheme of an entire country, one patent is not very many. In other terms, 10,000 more patent applications per year causes a 0.2 percentage point increase in the average growth for the following five years, holding all else constant. Since patents represent invention and innovation, this variable seems to represent technology well and support the main theories of economics.

The next model presented in Table 2, Model 2, is very similar to Model 1, but it includes Ethnic, representing the ethnic diversity within the countries. As data for Ethnic is limited, adding it to model reduces the number of observations to 107. Since the adjusted R^2 increases with the addition of this variable, its addition improves the model overall. Although the coefficient for Ethnic is not significant, other variables change in significance with its addition. The coefficient for Investment2, which is a proxy for capital stock, becomes significant, although only at the 10% level. Since the coefficient is positive, it means that an increase in investment increases the average economic growth for the following five years, which follows the main theories that increasing capital stock increases growth. As total investment increases by $1 (current prices in international dollars) average growth for the following five years increases by 0.0003 percentage points, holding all else constant. Additionally, in this model tertiary education's coefficient is no longer significant.

The third model presented in Table 2, Model 3, further adds to the first two models presented by including the variable Gender (GEM). The coefficient for this new variable is significant at the 5% level. Since higher values of GEM represent more gender equality, the positive directionality of the coefficient means that as gender equality

increases, the average growth for the following five years will also increase. The scale of its effects is slightly less intuitive to understand. As the GEM increases by one, holding all else constant, the average growth for the following five years increases by 5.00 percentage points. This seems extremely high, but it is crucial to think about the scale that GEM is measured on; the values can only range from zero to one so an increase of one is unrealistic. A more realistic interpretation is that as GEM increases by 0.1, holding all else constant, the average growth rate for the following five years increases by 0.50 percentage points. In this model, both Investment2 and Patents increase in significance level and their coefficients increase slightly. The rest of the variables remain at the same significance level with slight changes to the coefficient, but there are no drastic changes.

Model 4 is the model with the highest number of observations because Patents, a variable with limited data, is not included. This model is different from the previous models because it introduces regional dummies. These regional dummies account for any differences in the average five year growth rate which are attributable to the geographical region of a country and anything happening in that region that affects growth. They are rather crude proxies for this and cannot point to what exactly within these regions is causing the regional effects. Since the dummy for Region 1, East Asia and Pacific, is dropped, all of the other dummy variables are compared to Region 1. Of the six regional dummies, the coefficients for Regions 3, 4, and 7 are significant at the 1% level. Countries within Dummy Region 3, Latin America and the Caribbean, will have a five year average growth rate which is lower than that of countries in Region 1 by 2.92 percentage points on average, holding all else constant. Countries from Region 4, Middle East and North Africa, will have a five year average growth rate that is lower than that of

countries from East Asia and Pacific by 2.04 percentage points, holding all else constant. Region 7, Sub-Saharan Africa, has a five year average growth rate 3.11 percentage points lower than Region 1, holding all else constant. These three regions are comprised of developing countries whose GDPs per capita are extremely low compared to more developed countries. There are many possible reasons for the lower growth rates in these regions including politics, history, geographic location, resources, etc.

Other than the regional dummies, there is one important difference between this model and the previous models: the GINI coefficient is no longer significant, even at the 10% level. The reason that the GINI coefficient becomes insignificant with the addition of the regional dummies is that the GINI index tends to be similar in countries within the same region[9], so controlling for regions essentially controls for GINI as well, to a certain extent. Regions 3 and 7, two of the three significant regions, have by far the two highest means of GINI coefficients, 52.17 and 44.34, respectively. Region 6's mean, 39.20, is higher than that of Region 4, 37.38, but Region 6 has a much higher standard deviation than Region 4 (10.00 versus 3.80). Regions 3 and 4, two of the significant regions, have two of the lowest standard deviations (4.26 and 3.80 respectively), showing that the countries in these regions have similar GINI coefficients. Region 7, the third significant region, has a high standard deviation, but it also has a very high mean and median. Countries in this region experience high income inequality which differs broadly across forty countries. The fact that adding regional dummies to the models makes the GINI

[9] A table of the descriptive statistics (including the mean, median, standard deviation, etc.) of the GINI coefficient for each region is presented in Appendix 3.

coefficient no longer significant could be due to the fact that many regions have similar GINI coefficients.

The final model in Table 2, Model 5, contains the same variables as the previous model, but it also includes Patents. This addition raises the adjusted R^2 from 0.34 to 0.35, so adding in Patents improves upon the model. It is also the model with the highest adjusted R^2 of the five presented in Table 2, so it represents the best line of fit of all five. The results of this model are similar to the previous model; all of the variables that had significant coefficients in Model 4 still do, and the ones that were insignificant remain that way. The coefficient for the new variable, Patents, is significant at the 5% level and is still positive. In fact, the coefficient is the same as it was in Models 1 and 2[10], so it has the same effect on economic growth that it had in previous models. The same three regional dummies are significant in this model, though their significance levels all dropped from significant at the 1% level to a significance level of 5%. Their directionality remains the same, but the coefficients are all lower in absolute value, so when patents is included as a proxy for technology, the effect of these three regions on their countries' economic growths is weakened.

All of the other variables discussed in Section 4.1 were regressed as well, but their results are less pertinent to this thesis, so they are included in Appendices 4-9. The coefficient for the variable PoliStab(WGI), the proxy for political stability, which is presented in Appendix 4, is significant at the 5% level and has a positive effect on average economic growth for the following five year period. Having more political stability improves economic growth, supporting the ideas provided by Alesina et al.

[10] The full coefficients are not identical, but once truncated they are.

(1996) and Ades and Chua (1997). Neither of the variables used as proxies for corruption in this thesis nor property rights had coefficients which were significant (Appendices 5, 7, and 6 respectively). This does not discount any of the information presented about corruption or property rights in Chapter 2; it simply does not support or refute it since it does not prove to have significant results. Appendices 8 and 9 include the two additional proxies for income inequality to GINI (IncmIneq2 and IncmIneq3, respectively). The coefficient for IncmIneq2, the income share held by the top 10% divided by the income share held by the bottom 10%, is negative and significant at the 1% level which means that income inequality hurts economic growth. IncmIneq3, share of income held by the middle class (middle 60% of population), has a coefficient which is positive and significant at the 1% level which means that *equality* helps growth (or inequality hurts growth). Since both of these additional proxies for income inequality prove the same idea as the GINI coefficient, that inequality hurts growth, this is further proof and support for the argument.[11]

5.2 Case Studies[12]

Argentina

Throughout its history as a nation, Argentina has seen many different political regimes as well as times of great economic success contrasted with disasters, most recently from 1998-2002. Since its independence from Spain in 1810, tension has existed between the different provinces in the vast country. There is a history of great economic

[11] GINI is included in the main models because it is the most well known and commonly used measure for income inequality, while the other two were created for this thesis.

[12] All translations from Spanish are my own.

disparities between the regions, feeding this tension. Although these disparities have diminished somewhat, they still exist today. There were many years between Argentina's independence and its first stable national government which was not formed until 1862. One of the great economic problems that Argentina has battled since then has been inflation; it is still an issue today. The first major economic success that Argentina experienced was in the late 1800s when its exports of beef and wheat to Europe took off (Saxton 2003, 1-2). Argentina was so successful economically that many of the wealthy Argentines who made their fortunes during this period were known in Europe for being extravagant and wealthy. The French have a phrase when referring to someone who is extremely wealthy: "rich like an Argentine." This phrase came from seeing the wealthy Argentines travelling through Europe and spending their riches. Many of them bought castles from across Europe (mainly France), had them dismantled, brought them over to Argentina, and reconstructed them there. Their remnants are still visible in Argentina today (Goldman 2011).

This affluence and success did not continue at the same pace through the rest of Argentina's history, though. An economic crisis in 1890 and 1891, caused by problems with the budget of the federal government, was detrimental to Argentina's economy. Although they recovered from this crash and the economy grew again, this crisis was not unique in history. There were many periods of growth interrupted by periods of major economic crisis. World War I had a highly negative impact on Argentina's economy. The problem of inflation cropped up through history as well, especially from World War II on. It was as high as 102% in 1959, 335% in 1975, and 4,924% in 1989. These periods also saw many different government structures, each with its own consequences. The

most extreme was probably the regime of the military junta from 1976 to 1983 (Saxton 2003, 2-4). The military government killed approximately 30,000 people it saw as opponents during the period known as the "Guerra Sucia" (meaning Dirty War) also known as the time of the "desaparecidos" or the disappeared ones. Another important aspect of Argentina's political history was Juan Perón's presidencies. He served as president in the late 1940s and early 1950s as well as in the 1970s before the military junta. It was his death and the succession of the presidency by his wife that lead to the impressively high rates of inflation in the 1980s (Goldman 2011). The ups and downs of Argentina's economy throughout history seem to be somewhat tied to the political state of the country. This could support the idea that corruption and political instability harm economic growth, although there could be many other factors at play as well.

The Argentine economy went into a recession in 1995. It seemed to be recovering in 1996 and 1997, but it took a turn for the worse in 1998. Part of the reason for this was because of currency crises that were happening in Russia and Brazil at that time. In 1999, a new president, Fernando De la Rúa, came into power. He was concerned with budget deficit of the federal government, so he attempted to reduce that in order to encourage the economy. His government increased taxes and took enormous loans from the IMF, both of which negatively affected the economy. Many Argentines were concerned with the economy and the policies of De la Rúa's government, so they began withdrawing money from their accounts. The government responded by freezing bank deposits, which caused the recession to become a depression. This not only fueled the economic crisis, but it also caused mayhem in the political sphere; Argentina saw three different presidents in a two week period (Saxton 2003, 7-13).

In an attempt to save the economy, the new government of Eduardo Duhalde took possession of $14.5 billion of foreign reserves, some of which were the savings of Argentine citizens. They also devalued the peso, converted all dollars in banks to pesos, took all dollar bank reserves, and created new taxes and regulations. They essentially took billions of dollars from people of Argentina, many of whom lost some or all of their savings. This caused the economy to fall 5.5% in 2001 and 10.9% in 2002. Unemployment increased by 23.6% and the number of citizens below the poverty line increased to 57.5%. This crisis wreaked havoc on the economy of the Argentines which affected the country and its people in innumerable ways. The economy began to recover in the middle of 2002, but the effects of the crisis have not completely disappeared (Saxton 2003, 13-16). Although there are many factors in explaining the Argentine crisis in 2001, Saxton (2003) claims that "Bad economic policy turned what should have been a one-year recession into a four-year depression" (48). He blames the decisions made by Fernando De la Rúa's government for the depression and insists that in order for Argentina to have long term growth in their economy, they need to adopt more policies directed at economic freedom, "anchored in respect for property rights" (49). This shows that institutional factors, namely property rights in this case, are an explanation for economic growth. Saxton's (2003) argument that a "respect for property rights" could improve growth in Argentina shows their importance in economic growth.

Although Saxton discusses Argentina's economic recovery since the crisis in the early 2000s, there is one important aspect that he does not cover: inequality. In his article, Rohter (2007) discusses the fact that even though the economy has largely recovered, there is still a huge problem with inequality. "The fruits of the rapid expansion of

commerce, construction, corporate profits and exports are not being shared by all. As a result, economic and social inequality have intensified" (Rohter 2007). He describes Argentina as a country that places egalitarianism high on its priority list and that the economic and social inequality that it has now are troubling to the Argentine people. The income inequality within Argentina has grown by staggering amounts since the 1970s: the top 10% had 12 times the income of the poorest 10% in the 1970s and 43 times that of the poorest 10% in 2002 during the crisis. Since then, even though many aspects of the economy have improved, the level of inequality has not improved nearly as much. The inequality can easily be seen in the surrounding areas of Buenos Aires; there are rich suburbs filled with mansions contrasted with the nearby villas or shantytowns which house many poor Argentines (Rohter 2007).

Leonardo Gasparini (2006) describes the frustrations of the Argentine people towards this inequality within their nation. He explains that four years after the crisis, the economy had completely recovered but there have not been any improvements with regard to inequality even though the government had promised to improve it. He claims that "El Gobierno publicita sus logros, pero guarda silencio respecto del que alguna vez fuera su principal objetivo" (The government publicizes its achievements but remains silent with respect to what was once its principal objective), (Gasparini 2006). He is disenchanted with the current government and believes that inequality is one of the biggest problems faced by Argentina, so the government should take an active role in attempting to reduce it. One of the reasons that Gasparini cites for this increased problem of inequality is that with advances in technology, there are many fewer jobs available to unskilled laborers, especially in factories. He states, "En el nuevo contexto productivo

hay pocos puestos en los que ese joven tenga una productividad tal que le permita aspirar a un salario comparable al que tenía su padre trabajando en una fábrica tres décadas atrás. O bien esa fábrica no existe más, o ya no necesita tantos obreros no calificados" (In the new productive context, there are very few jobs in which this young man has a productivity which permits him to aspire to a salary comparable to that which his father had working in a factory three decades ago. Or even that this factory does not exist anymore or that it does not need as many unskilled workers anymore) (Gasparini 2006). The author realizes that these factories are not going to return to a situation where they need as many workers as they did in previous decades, but he believes that the government should take action against inequality. His suggestions include public social spending that is focused and efficient, improvements to education, and better welfare policies. The fact that Gasparini (2006) discusses the position of a son in relation to his father relates to social mobility. He discusses the idea of a son not even having the same opportunities as his father, never mind more opportunities. Gasparini (2006) wants the government to increase social mobility so that these people are not stuck looking for jobs similar to the previous generation, especially since many of these jobs no longer exist.

The government has since addressed this issue and its intent to decrease this problematic inequality. "El ministro bonaerense de Desarrollo Humano, Daniel Arroyo, dijo este lunes que si bien el país ha crecido en los últimos 5 años, aún está pendiente de resolver la gran brecha que existe entre ricos y pobres" (The Buenos Aires Minister of Development, Daniel Arroyo, said Monday that while the country has grown in the last five years, it still has to resolve the large gap that still exists between the rich and poor) (La Provincia 2008). Arroyo names the problem of inequality as the main problem faced

by Argentina, namely the difference between the richest 10% and the poorest 10%. He also notes that this inequality has negative effects on the society because it "genera bronca y tensión social porque muchos sectores ven que no pueden mejorar" (generates anger and social tensions because many sectors see that they cannot improve). This real life example speaks against the theory discussed by Breen (1997) that inequality improves growth by providing incentives; the poor people who see what the rich have become frustrated rather than inspired to do better. Another result is that there is a group of young adults who have difficulty keeping jobs because they did not see their father keep a job due to the crisis (La Provincia 2008).

Inequality has many effects on society, much deeper than simply tension and unhappiness over the situation. The Central de Trabajadores Argentinos (CTA) (Argentine Workers Central) released a report that discussed the inequality but also its consequences. According to them, "Los riesgos para el futuro argentino descansan en los efectos negativos que la desigualdad y la concentración tienen sobre la posibilidad de sostener el ritmo de crecimiento y de transformarlo en desarrollo para el conjunto de la sociedad" (The risks for the Argentine future lie in the negative effects that the inequality and the concentration have on the possibility to sustain the rhythm of growth and of transforming the development for the whole of society) (Según la CTA). This article discusses the fact that inequality can harm economic growth, so even though Argentina has seen an economic recovery and growth since the crisis, the high levels of inequality are still a concern with regard to growth.

Another aspect of the concerns stemming from inequality relate to social tensions and problems. Roxana Kreimer (2011) discusses the proven correlation between

inequality and social violence; it is the factor that is most tied to social violence according to many different studies throughout the world. One of these studies was done in Argentina and proves that inequality has wide ranging effects that are not always direct. Kreimer (2011) says,

> La desigualdad no genera por sí sola el delito, pero acentúa sus condiciones de posibilidad mediante el debilitamiento familiar, la pérdida de lazos comunitarios y el atractivo de un camino trasgresor…las sociedades que se pretenden democráticas plantean en lo formal las mismas metas para todos, pero en la práctica sólo algunos las pueden alcanzar. (Inequality does not generate the offence alone, but it emphasizes the conditions that make it possible by weakening family, loss of community ties, and the attractiveness of a transgressive path…the societies that are formally democratic intend to have the same goals for everyone, but in practice only some can achieve them).

She claims that this is the reason that there is so much social violence in societies where there is a lot inequality but not in societies where there is much poverty yet little inequality. When there are high levels of inequality, the poverty stricken people see what the wealthier people have, yet they feel as though they will never be able to reach that place, so they turn to violence, often in the form of robberies.

Argentina is just one example of a country that has a high level of inequality which can not only harm the nation's economy but also the social balance within the country. High rates of inequality are problematic throughout Latin America today. The regression analysis of this thesis determined that inequality harms growth, but also that

countries in Region 3 (Latin America and Caribbean) which includes Argentina, have lower growth rates than countries in Region 1 (East Asia and Pacific). Additionally, since the GINI coefficient is no longer significant when regional dummies are included, the countries within Region 3 have similar inequalities and using regional dummies essentially controls for income inequality. These regression results support the findings of this case study in discussing the problems of income inequality throughout Latin America, including Argentina.

A positive note is that "Over the past two decades, there has been a general trend for inequality to decrease in highly unequal societies (particularly Latin America)," (International 2011). Although this is true, and Argentina has lowered its inequality somewhat, it is still relatively high and worrisome. The case of Argentina supports the regression analysis in this thesis that income inequality is harmful to growth and should therefore be reduced. Additionally, it shows an additional layer of information: that inequality can be very hard to combat (it managed to come back economically from the crisis, yet inequality has not decreased very much) and that it has many negative consequences, not just economically. Overall, this once again supports the point that decreasing income inequality is a worthy goal for governments for both ethical and economic reasons.

China

China has seen very high rates of economic growth since it became an open economy in 1978, but its economy still faces many issues. One challenge China faces is that it is highly dependent upon the economies of other countries throughout the world, especially the United States. This is because most of its growth was the result of exports

due to its low labor costs. Within China, however, consumption has not grown nearly as much. Because of this, when there are problems with the economies of other countries, China's economy is also affected. In the 1990s, China went through a labor market reform which has affected the income inequalities of the labor force (Lu and Gao 2011, 101-102). This labor reform "sought to achieve a better allocation of labour and to improve incentives for the labour force" (Lu and Gao 2011, 117).

This reform took place in two different stages, the first from 1986-1996. This first stage was more gradual and most of the people shared the rewards that came with the economic growth. In the second part of the reform, which happened after 1996, the changes were less gradual and there were more negative effects for some segments of the population. Unemployment increased and income inequality increased, especially in the urban parts of China. In addition, "the widening of income inequality has indeed been accompanied by a decline in labour's share of national income," (Lu and Gao 2011, 118-119). During the entire labor reform, many workers have migrated from rural areas to urban areas, increasing the labor force within cities while simultaneously hurting the market position of laborers due to the ease with which they could be replaced (Lu and Gao 2011, 110). Many of these workers are unskilled and their rights are not very well protected or enforced. They are at a disadvantage because "The globalization process has brought about an unprecedented combination of capital and knowledge at the international level, yet workers remain at a comparative disadvantage," (Lu and Gao 2011, 119). The labor reform has helped the economy overall, but individual workers do not necessarily benefit from it.

The high level of trade and an open economy positively affect the urban areas of China much more than the rural areas. This means that income inequality between people from different regions continues to grow as urban areas reap the benefits of trade while the rural areas do not. During its period of high economic growth, especially from 2003-2007, there was very little focus on the income inequality that was happening; although it was problematic, it was not seriously considered as a threat. In reality, this inequality can hurt China's growth in many different ways. Lu and Gao (2011) point to four distinct ways that increasing income inequality can harm economic growth: it can "increase the number of low-income households facing credit constraints and thus lead to a decline in physical and human-capital investment by them;" "cause more people to advocate redistributive policies, which require higher taxes – and higher taxes have negative effects on economic growth;" it "can bring about social and political unrest, deteriorate the investment environment and so result in increased allocation of resources to property protection and a decline in the accumulation of productive physical capital;" and it "increases the proportion of low-income families, which generally have more children and invest less in human capital, leading to a decline in educational attainment levels and thereby possibly jeopardizing economic growth," (119-120). They also point out that it can increase crime due to social unrest. There is an interesting tie between income inequality and poverty rates; it is estimated that "if the GINI coefficient for urban China increases by 10 per cent, urban poverty will rise by about 15%...the corresponding increases in rural poverty are approximately 21 per cent and 35 per cent, respectively," (Lu and Gao 2011, 120).

These arguments support the regression analysis results that income inequality harms economic growth. Although China's high income inequality paired with rapid growth may seem to contradict this point, this case study shows that there were many other reasons for China's overwhelming economic growth. Income inequality harmed growth, but the other factors were so overwhelming that growth was still very high. Both the regression analysis results and this case study suggest that China's economic growth could be even higher, and potentially more stable, if income inequality was reduced.

Income inequality has social consequences too, including more risky behaviors related to health, such as alcohol consumption and smoking, and happiness and trust may decrease (Lu and Gao 2011, 120-121). The authors believe that this situation of increasing income inequality is reparable, however, "If the labour market reform strategy is wisely adjusted, income disparities can effectively be narrowed, and labour market reform will become fully beneficial to the ultimate objective of economic growth" (Lu and Gao 2011, 122).

One of the most important concerns about income inequality in China relates to the disparity between the rural and the urban areas. The government attempted to address this issue in 2007 using policies to control the GINI coefficient at 0.45 and decrease it to 0.40 by 2020. This is the coefficient for the income inequality across all of China, but most of the problem is caused by the differences between rural and urban areas. The income per capita of an urban resident is about three times that of a resident of a rural area. It is not simply the income that is unequally divided; people who live in rural areas have less access to health care as well, furthering the inequality. The government

introduced policies that supported rural residents, especially those in the agriculture industry through tax breaks, subsidies, and more rights (Saich 2007, 39-41).

This example of China shows clearly that income inequality is problematic, even in countries that are experiencing high growth, supporting the regression results in this thesis. Since it can impede economic growth, it should be decreased for economic reasons in addition to the ethical reasons. The case study of China shows that income inequality should be decreased for multiple economic reasons, not just to increase economic growth currently, but because income inequality can cause many problems in times of economic hardship as well. These potential problems during economic hardship are not as obvious when the economy is in a good situation and can easily be missed or ignored until it is too late. It took a global economic crisis for it to be clear that the income inequality in China was a serious problem that needed to be dealt with and this shows that it is something that should be reduced in any economic situation because it could become problematic at some point.

5.3 Conclusion

The empirical studies in this chapter use regression analysis and case studies to examine economic growth and factors affecting it, namely income inequality. Both methods come to the conclusion that income inequality is harmful to economic growth, which provides an enormous incentive for countries to work to reduce their levels of income inequality. The regression analysis determines this using data and equations while the case studies provide proof through a more personal way: through formal and informal reports concerning income inequality and its effects on countries. The fact that both types

of analysis establish that income inequality harms growth, grants more credibility to the argument. Both types of empirical analysis also show that there are many complex factors affecting economic growth, some of which are relatively well understood, while others are not as clear. Including the case studies as a second type of empirical analysis in this thesis enriches and bolsters the results of the regression analysis as well as more fully proving the importance of income inequality on economic growth.

CHAPTER 6

Conclusions

6.1 Summary of Findings and Implications of Results

This thesis aims to determine how different basic, institutional, economic, and demographic factors affected economic growth with a focus on income inequality. For the most part, the variables in this thesis behave in the ways that they were expected to based on basic theories and previous literature. Investment, when significant, helps growth; education, when significant, helps growth; a higher initial GDP leads to lower growth, supporting the catch-up effect; internet proves not to be a good proxy for technology, but is perhaps a distraction instead and hurts growth; patents are a good proxy for technology and help growth; and gender equality helps growth. These findings are all important and relevant to the topic, but the most important result from the empirical results is that income inequality, no matter how it is measured, harms economic growth when regional differences are not controlled for. The coefficient of income inequality, however, is not statistically significant in models that include regional dummies. Of the factors considered in this study, income inequality is the variable that is the least well understood; there are theories that present opposite ideas about the directionality of its effect.

The results in this thesis concerning income inequality add to Panizza's (2002) statement that income inequality is often shown to harm economic growth in cross country studies. Additionally, it supports Breen's (1997) mathematical model that shows how inequality can negatively affect the economic growth of the country. Although there are studies that find the opposite results using different methods and samples, the results

of this thesis support the majority of empirical works on cross country studies focused on the effects of income inequality on economic growth.

Since income inequality harms growth in most of the models, there are economic reasons, in addition to the ethical reasons, for reducing it. Governments and societies have an economical reason to want to decrease their inequality, in order to improve their economic growth rates. Reducing income inequality is not a simple task to undertake as there are many different factors behind a person's income and the disparities across the citizens within a country. There are two main policy changes that could reduce income inequality: making a more progressive tax system or improving the education levels within a country. A more progressive tax system has marginal tax rates that increase as income increases, so that those with higher income pay a higher tax rate. This would help lessen inequality because less of the tax incidence would fall onto the poorer segment of society, enabling them to keep more of their income, thereby bringing them closer to the wealthier segment of society. There could still be enormous disparities in income, but this is one action that the government can take to reduce the disparities somewhat. Additionally, the government could use some of the tax revenue from the higher income portion of society to support the lower income portion of society through programs such as welfare. The other policy change that could decrease inequality, and could do so on a more long term basis, is improving education, especially for poorer children. There are huge gaps between the levels and qualities of education received by poor and rich children throughout the world. If children were given more equal educations, they would be more able to compete later in life for higher paying jobs. It would put people from different backgrounds on a more level playing field which could reduce income

inequality while simultaneously increasing social mobility. This policy could take a long time to show results on inequality and subsequently on economic growth, but it could help a country economically and it is more ethically sound.

The discussion about the effects of income inequality and policies to reduce it relate very closely to the concept of social mobility. Although this variable could not be included in the regressions in this thesis due to lack of available data, social mobility is still very important. Since social mobility reflects how closely a person's income and career are connected to that of his/her parents' incomes and careers, it reflects how likely it is that a person with a lower economic family background will be able to break from that mold and improve his/her economic situation. A country with more social mobility would not necessarily have less income inequality. Imagine a simple scenario where the child of a rich family becomes poor and the child of a poor family becomes rich; there is social mobility since they are not in the same situation as their parents, but there is still just as much income inequality in that society. It is possible, though that increasing social mobility within a society would allow its citizens to all work in areas that they are most suited to, thereby increasing economic growth and possibly leading to a reduction in income inequality as well. The policy of improving education equality for children is definitely a policy that can be used to increase social mobility, as well as reduce income inequality.

6.2 Strengths and Weaknesses of This Thesis

This thesis presents valuable information about the different factors that affect economic growth, namely income inequality. The results about many of the different

variables tested are significant, which grants credibility to the overall findings. It includes two different types of empirical analysis: regression analysis and case studies, which enhances and enriches the results. This is not the first study to use regression analysis to prove that inequality hurts economic growth, but it is not identical to any other such study since the other variables that it includes are unique to this particular thesis. Since other literature finds the opposite effect, this thesis adds to the body of knowledge supporting the idea that income inequality harms economic growth, which strengthens that argument.

This thesis does, however, have many limitations. First and foremost, the number of observations included in the data set was limited by the availability of data and certain variables reduced the number of observations even more. Observations were only included from two different time periods since many of the variables had little to no information that went back many years. A more complete data set that covers a longer time period could improve upon the results. The fact that countries were selected purely based upon availability of data could cause a sample selection bias, although there are countries from all of the regions of the world in the final data set. Many of the factors in this study do not have ideal variables that represent them, so proxies, which are less than ideal, had to be used. The proxies used in this study are relatively good representations of the factors studied, but they are not perfect. There are many more factors that could affect economic growth which are not included in this study, although it attempted to include the most important and relevant ones. Finally, social mobility could not be included in the regression analysis of this paper since very few countries have data pertaining to it.

6.3 Suggestions for Future Research

The research about factors affecting economic growth will continue well into the future since it has such an enormous impact. Additionally, research surrounding income inequality will continue as well since there is still dispute over its exact effects and since it is high in many countries. This particular study could be improved upon in the future by collecting a more complete data set. If the data were more complete, the results would be more accurate and reliable. Having fewer holes in the data would allow more observations to be included in the regression analysis. This refers not only to having more complete information for each of the variables in 2000 and 2005, but also to increasing the time period studied. If the time period could be increased, both ordinary least squares and panel regressions could be run to study the effects of the different factors on economic growth more completely. The number of factors that affect economic growth is vast and many cannot be measured. More factors could be tested to see whether they have an effect on economic growth or not and whether they improve the results of the study. Not very many countries have data regarding social mobility since it involves information about multiple generations of a family. If this type of data could be gathered in more countries and included in this study, it might add interesting results. Lastly, the case studies highlight two specific countries related to this study, but including more case studies could broaden the discussion and further enrich the regression results.

Bibliography

Ades, Alberto, and Hak B. Chua. 1997. Thy Neighbor's Curse: Regional Instability and Economic Growth. *Journal of Economic Growth* 2 (3) (Sep.): 279-304.

Alesina, Alberto, and Eliana La Ferrara. 2005. Ethnic Diversity and Economic Performance. *Journal of Economic Literature* XLIII (September): 762-800.

Alesina, Alberto, Sule Özler, Nouriel Roubini, and Phillip Swagel. 1996. Political Instability and Economic Growth. *Journal of Economic Growth* 1 (2) (Jun.): 189-211.

Bangwayo-Skeete, Prosper, Afaf H. Rahim, and Precious Zikhali. 2011. Does Education Engender Cultural Values that Matter for Economic Growth? *Journal of Socio-Economics* 40 (2) (April): 163-71.

Barro, Robert J. 1991. Economic Growth in a Cross Section of Countries. *The Quarterly Journal of Economics* 106 (2) (May): 407-443.

Barro, Robert J. 1996. Institutions and Growth, an Introductory Essay. *Journal of Economic Growth* 1 (2) (Jun.): 145-148.

Barro, Robert J. and Jong-Wha Lee. 2011 "Educational Attainment Dataset." <barrolee.com>.

Blanchard, Olivier. 2009. *Macroeconomics*. 5th ed. Upper Saddle River, N.J.: Pearson Prentice Hall.

Berik, Gü, Meulen Rodgers van der, and Stephanie Seguino. 2009. Feminist Economics of Inequality, Development, and Growth. *Feminist Economics* 15 (3) (Jul): 1-33.

Breen, Richard. 1997. Inequality, Economic Growth and Social Mobility. *The British Journal of Sociology* 48 (3) (Sep.): 429-449.

"Corruption Perceptions Index," Transparency International, accessed February 1, 2012, http://cpi.transparency.org/.

d'Addio, Anna Cristina. 2007. Intergenerational Transmission of Disadvantage: Mobility or Immobility across Generations? A Review of the Evidence for OECD Countries. *OECD Social, Employment and Migration Working Papers*: 1-115.

Dahan, Momi, and Daniel Tsiddon. 1998. Demographic Transition, Income Distribution, and Economic Growth. *Journal of Economic Growth* 3 (1) (Mar.): 29-52.

Drury, A. Cooper, Jonathan Krieckhaus, and Michael Lusztig. 2006. Corruption, Democracy, and Economic Growth. *International Political Science Review* 27 (2) (Apr.): 121-136.

Economic Growth. 2006. *Collins Dictionary of Economics.* London, United Kingdom: Collins.

Economic Growth Models. 1995. *Dictionary of Economics, Wiley.* Hoboken, NJ, USA: Wiley.

Fréchette, Guillaume R. 2006. A Panel Data Analysis of the Time-Varying Determinants of Corruption. <https://files.nyu.edu/gf35/public/print/frechette_corruption_new.pdf>.

Gasparini, Leonardo. 2006. "La frustración distributiva." *El día,* April 25. Accessed February 2, 2012, <http://www.eldia.com.ar/catalogo1/20060425/opinion1.asp>.

Gender Empowerment Measure (GEM) (1996-2009). 2009. "Human Development Reports" United Nations Development Programme. <http://hdr.undp.org/en/reports/global/>.

Goldman, Joe. 2011. “On Being a News Correspondent in South America.” Union College Mini Term. Bauen Hotel, Buenos Aires, Argentina. November 28.

Heston Alan, Robert Summers and Bettina Aten, Penn World Table Version 7.0, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, May 2011.

INTERNATIONAL: Persistent Inequality Affects Growth. 2011. United Kingdom: Oxford Analytica Ltd. http://search.proquest.com/docview/876076085?accountid=14637.

Kaufmann, Daniel, Aart Kraay, and Massimo Mastruzzi. 2011. “The Worldwide Governance Indicators Project” The World Bank. <http://info.worldbank.org/governance/wgi/index.asp>.

Klasen, Stephan, and Francesca Lamanna. 2009. The Impact of Gender Inequality in Education and Employment on Economic Growth: New Evidence for a Panel of Countries. *Feminist Economics* 15 (3) (Jul): 91-132.

Kreimer, Roxana. 2011. “Violencia social, de la mano de la desigualdad.” *Clarín Opinión,* May 10. Accessed February 2, 2012, <http://www.clarin.com/opinion/Violencia-social-mano-desigualdad_0_478152260.html>.

“La Provincia advierte sobre la brecha entre ricos y pobres.” 2008. *El día,* June 30. Accessed February 2, 2012, <http://www.eldia.com.ar/catalogo/20080630/20080630144546.htm>.

Lu, Ming, and Hong Gao. 2011. Labour Market Transition, Income Inequality and Economic Growth in China. *International Labour Review* 150 (1-2): 101-26.

OECD. 2010. A Family Affair: Intergenerational Social Mobility across OECD Countries. Chapter 5 in *Economic Policy Reforms: Going for Growth*: 183-200.

Panizza, Ugo. 2002. Income Inequality and Economic Growth: Evidence from American Data. *Journal of Economic Growth* 7 (1) (Mar.): 25-41.

Rohter, Larry. 2007. "Inequality Grows In Argentina Fruits Of Good Economy Not Shared By All." *South Florida Sun Sentinel,* January 6. Accessed February 2, 2012.

Sachs, Jeffrey D. and Andrew M. Warner. 1995. Economic Convergence and Economic Policies. *NBER Working Paper Series* Working Paper No. 5039. (Feb).

Saich, Tony. 2007. China in 2006: Focus on Social Development. *Asian Survey* 47 (1) (January/February): pp. 32-43.

Saxton, Jim. 2003. Argentina's Economic Crisis: Causes and Cures. Joint Economic Committee, United States Congress. June.

"Según la CTA, el 30% más rico concentra el 60% de la riqueza." *El día.* Accessed February 2, 2012, <http://www.eldia.com.ar/catalogo/20080213/20080213180841.htm>.

"World Development Indicators & Global Development Finance." 2011. The World Bank. <http://data.worldbank.org/indicator/all>.

The World Factbook. 2010. Central Intelligence Agency [database online]. Available from <https://www.cia.gov/library/publications/the-world-factbook/fields/2075.html>.

Zak, Paul J. 2002. Institutions, Property Rights, and Growth. *Recherches Économiques De Louvain / Louvain Economic Review* 68 (1/2, The New Economy: Implications and Viability): 55-73.

Tables:

Table 1. Descriptive statistics of maximum number of observations used in any model.

Variable	n	Mean	Median	Minimum	Maximum	Std.Dev.
Dependent Variable:						
Av5YrGDP (%)	178	3.02	2.68	-2.70	10.84	2.33
Basic Variables:						
EduTertiary (%)	178	7.14	5.85	0.1	30.6	6.07
Investment2 (International Dollars)	178	2193.50	1065.61	21.79	37752.04	3765.72
Internet (users per 100 people)	178	10.81	5.15	0.03	61.48	13.85
Patents (# of applications)	117	4597.62	234	3	164795	19311.82
GDP2000US ($US)	178	4933.96	1575.21	91.23	46457.89	8377.71
Institutional Variables:						
PoliStab(WGI)	177	-0.22	-0.19	-2.72	1.62	0.91
Corruption(WGI)	177	-0.17	-0.41	-1.46	2.57	0.94
Corruption CPI	163	3.91	3.3	1.5	10	1.95

Variable	n	Mean	Median	Minimum	Maximum	Std.Dev.
PropRights (days)	84	644.54	575	210	1459	290.49
Economic Variables:						
GINI	178	41.12	39.44	24.70	67.40	9.02
IncmIneq2	177	17.98	11.87	5.61	100.18	1.12
IncmIneq3 (%)	177	46.11	46.9	25.34	55.86	5.54
Demographic Variables:						
Gender(GEM)	128	0.48	0.48	0.12	0.83	0.14
Ethnic (%)	160	71.62	77.8	15.5	99.7	23.04

Table 2. Empirical results of main models.

	Model 1	Model 2	Model 3	Model 4	Model 5
Variable	Coefficient (S.D.)	Coefficient (S.D.)	Coefficient (S.D.)	Coefficient (S.D.)	Coefficient (S.D.)
n (Number of Observations)	117	107	89	178	117
Constant	8.552*** (1.028)	7.919*** (1.572)	5.184*** (1.770)	4.694*** (1.186)	6.481*** (1.866)
GINI	-0.122*** (0.023)	-0.118*** (0.025)	-0.094*** (0.024)	0.009 (0.027)	-0.042 (0.045)
Investment2	0.000 (0.000)	0.0003* (0.0002)	0.0004** (0.0002)	0.000 (0.000)	0.000 (0.000)
EduTertiary	0.068* (0.035)	0.052 (0.036)	0.022 (0.035)	0.050 (0.032)	0.035 (0.037)
GDP2000US	-0.0002*** (0.00005)	-0.0002*** (0.0005)	-0.0002*** (0.0005)	-0.00009*** (0.00003)	-0.0001** (0.00005)
Internet	-0.045*** (0.016)	-0.053*** (0.017)	-0.063*** (0.018)	-0.040*** (0.015)	-0.049*** (0.016)
Patents	0.00002** (0.00001)	0.00002** (0.00001)	0.00003*** (0.00001)		0.00002** (0.00001)
Gender (GEM)			5.003** (1.959)		
Ethnic		0.010 (0.010)	0.007 (0.011)		
Dummy Region 2 (Europe & Central Asia)				0.229 (0.564)	0.341 (0.666)
Dummy Region 3 (Latin America & Caribbean)				-2.924*** (0.650)	-1.898** (0.900)

	Model 1	Model 2	Model 3	Model 4	Model 5
Dummy Region 4 (Middle East & North Africa)				-2.044*** (0.675)	-1.655** (0.766)
Dummy Region 5 (North America)				-0.105 (1.593)	-1.130 (1.815)
Dummy Region 6 (South Asia)				-1.147 (0.762)	-0.995 (0.952)
Dummy Region 7 (Sub-Saharan Africa)				-3.113*** (0.598)	-2.297** (1.076)
Adjusted R^2	0.307	0.323	0.318	0.344	0.351
F-Stat	(6, 110) = 9.550	(7, 99) = 8.210	(8, 80) = 6.123	(11, 166) = 9.456	(12, 104) = 6.220

*** indicates statistically significant at the 1% level

** indicates statistically significant at the 5% level

* indicates statistically significant at the 10% level

Appendices:

Appendix 1. Observations included in Descriptive Statistics, and the regions and GINI coefficients associated with them.

Country	Years Included		Region	GINI 2000	GINI 2005
Albania	2000	2005	2	28.15	33.03
Argentina	2000	2005	3	49.84	50.03
Armenia	2000	2005	2	36.01	33.8
Austria	2000		2	29.15	
Bangladesh	2000	2005	6	30.72	31.02
Belgium	2000		2	32.97	
Belize	2000		3	54.41	
Benin	2005		7		38.62
Bolivia	2005		3		58.19
Brazil	2000	2005	3	58.59	56.39
Bulgaria	2000	2005	2	34.34	29.22
Burundi	2000	2005	7	42.39	33.27
Cambodia	2005		1		41.85
Cameroon	2000	2005	7	44.56	38.91
Canada	2000		5	32.56	
Central African Republic	2005		7		43.57
Chile	2000	2005	3	55.36	52
China	2005		1		41.53
Colombia	2000	2005	3	57.5	58.49
Congo, Dem. Rep.	2005		7		44.43
Congo, Rep.	2005		7		47.32
Costa Rica	2000	2005	3	46.6	47.23
Cote d'Ivoire	2000		7	43.75	
Croatia	2000	2005	2	31.33	28.99
Denmark	2000		2	24.7	
Dominican Republic	2000	2005	3	52.11	49.97
Ecuador	2000	2005	3	53.53	53.65
Egypt, Arab Rep.	2000	2005	4	32.76	32.14
El Salvador	2000	2005	3	51.92	49.7
Estonia	2000	2005	2	37	36
Finland	2000		2	26.88	
Gabon	2005		7		41.45
Gambia, The	2000	2005	7	50.23	47.28

Country	Years Included		Region	GINI 2000	GINI 2005
Germany	2000		2	28.31	
Ghana	2000	2005	7	40.75	42.76
Greece	2000		2	34.27	
Guatemala	2000	2005	3	55.11	53.69
Guyana	2000		3	44.54	
Haiti	2000		3	59.5	
Honduras	2000	2005	3	51.5	56.71
Hungary	2000	2005	2	27.32	30.04
India	2005		6		36.8
Indonesia	2005		1		39.41
Iran, Islamic Rep.	2000	2005	4	44.1	38.28
Iraq	2005		4		30.86
Ireland	2000		2	34.28	
Israel	2000		4	39.2	
Italy	2000		2	36.03	
Jamaica	2000	2005	3	44.22	45.51
Jordan	2000	2005	4	36.42	37.72
Kazakhstan	2000	2005	2	31.3	33.85
Kenya	2000	2005	7	42.51	47.68
Korea, Rep.	2000		1	31.59	
Kyrgyz Republic	2000	2005	2	34.6	32.93
Lao PDR	2000	2005	1	32.63	36.74
Latvia	2000	2005	2	33.52	35.73
Lesotho	2005		7		52.5
Liberia	2005		7		38.16
Lithuania	2000	2005	2	31.85	35.81
Luxembourg	2000		2	30.76	
Malawi	2000	2005	7	50.31	39.02
Malaysia	2000	2005	1	49.15	37.91
Maldives	2000	2005	6	63.27	37.37
Mali	2000	2005	7	40.01	38.99
Mauritania	2000		7	39.04	
Mexico	2000	2005	3	53.08	50.93
Moldova	2000	2005	2	36.86	35.6
Mongolia	2000	2005	1	30.27	33.03
Morocco	2000	2005	4	39.46	40.88
Mozambique	2005		7		47.11
Nepal	2005		6		47.3

Country	Years Included		Region	GINI 2000	GINI 2005
Netherlands	2000		2	30.9	
New Zealand	2000		1	36.17	
Nicaragua	2000	2005	3	50.3	52.33
Niger	2005		7		43.89
Norway	2000		2	25.79	
Pakistan	2000	2005	6	33.02	31.18
Panama	2000	2005	3	56.56	54.88
Paraguay	2000	2005	3	56.85	53.89
Peru	2000	2005	3	53.01	51.97
Philippines	2000	2005	1	46.09	44.04
Poland	2000	2005	2	32.93	34.92
Portugal	2000		2	38.45	
Qatar	2005		4		41.1
Romania	2000	2005	2	30.25	31.5
Russian Federation	2000	2005	2	37.48	37.51
Rwanda	2000	2005	7	46.68	53.08
Senegal	2000	2005	7	41.25	39.19
Serbia	2005		2		28.16
Sierra Leone	2005		7		42.52
Singapore	2000		1	42.48	
Slovenia	2000	2005	2	28.41	31.15
South Africa	2000	2005	7	57.77	67.4
Spain	2000		2	34.66	
Sri Lanka	2000	2005	6	41.06	40.26
Swaziland	2000		7	50.68	
Sweden	2000		2	25	
Switzerland	2000		2	33.68	
Syrian Arab Republic	2005		4		35.78
Tajikistan	2000	2005	2	31.52	33.61
Tanzania	2000	2005	7	34.62	37.58
Thailand	2000	2005	1	43.15	42.45
Togo	2005		7		34.41
Tunisia	2000		4	40.81	
Turkey	2000	2005	2	42.71	43.23
Uganda	2000	2005	7	43.07	42.62
Ukraine	2000	2005	2	28.96	28.21
United Kingdom	2000		2	35.97	
United States	2000		5	40.81	

Country	Years Included		Region	GINI 2000	GINI 2005
Uruguay	2000	2005	3	44.56	44.94
Venezuela, RB	2000	2005	3	49.53	47.61
Vietnam	2000	2005	1	35.52	39.16
Yemen, Rep.	2000	2005	4	33.44	37.69
Zambia	2000	2005	7	53.44	50.74

Appendix 2. Observations included in Model 1, and the regions and GINI coefficients associated with them.

Country	Years Included		Region	GINI 2000	GINI 2005
Argentina	2000		3	49.84	
Armenia	2000	2005	2	36.01	33.8
Austria	2000		2	29.15	
Bangladesh	2000	2005	6	30.72	31.02
Belgium	2000		2	32.97	
Brazil	2000	2005	3	58.59	56.39
Bulgaria	2000	2005	2	34.34	29.22
Canada	2000		5	32.56	
Chile	2000	2005	3	55.36	52
China	2005		1		41.53
Colombia	2000	2005	3	57.5	58.49
Croatia	2000	2005	2	31.33	28.99
Denmark	2000		2	24.7	
Ecuador	2000	2005	3	53.53	53.65
Egypt, Arab Rep.	2000	2005	4	32.76	32.14
Estonia	2000	2005	2	37	36
Finland	2000		2	26.88	
Germany	2000		2	28.31	
Greece	2000		2	34.27	
Guatemala	2000	2005	3	55.11	53.69
Honduras	2000		3	51.5	
Hungary	2000	2005	2	27.32	30.04
India	2005		6		36.8
Indonesia	2005		1		39.41
Iran, Islamic Rep.	2000	2005	4	44.1	38.28
Ireland	2000		2	34.28	
Israel	2000		4	39.2	
Italy	2000		2	36.03	
Jamaica	2000	2005	3	44.22	45.51
Jordan	2000	2005	4	36.42	37.72
Kazakhstan	2000	2005	2	31.3	33.85
Kenya	2000	2005	7	42.51	47.68
Korea, Rep.	2000		1	31.59	
Kyrgyz Republic	2000	2005	2	34.6	32.93
Latvia	2000	2005	2	33.52	35.73
Lithuania	2000	2005	2	31.85	35.81

Country	Years Included		Region	GINI 2000	GINI 2005
Luxembourg	2000		2	30.76	
Malawi	2000		7	50.31	
Malaysia	2000	2005	1	49.15	37.91
Mexico	2000	2005	3	53.08	50.93
Moldova	2000	2005	2	36.86	35.6
Mongolia	2000	2005	1	30.27	33.03
Morocco	2000	2005	4	39.46	40.88
Mozambique	2005		7		47.11
Netherlands	2000		2	30.9	
New Zealand	2000		1	36.17	
Nicaragua	2000		3	50.3	
Norway	2000		2	25.79	
Pakistan	2000	2005	6	33.02	31.18
Panama	2000		3	56.56	
Peru	2000	2005	3	53.01	51.97
Philippines	2000	2005	1	46.09	44.04
Poland	2000	2005	2	32.93	34.92
Portugal	2000		2	38.45	
Romania	2000	2005	2	30.25	31.5
Russian Federation	2000	2005	2	37.48	37.51
Serbia	2005		2		28.16
Singapore	2000		1	42.48	
Slovenia	2000	2005	2	28.41	31.15
Spain	2000		2	34.66	
Sri Lanka	2000	2005	6	41.06	40.26
Sweden	2000		2	25	
Switzerland	2000		2	33.68	
Syrian Arab Republic	2005		4		35.78
Tajikistan	2000	2005	2	31.52	33.61
Thailand	2000	2005	1	43.15	42.45
Tunisia	2000		4	40.81	
Turkey	2000	2005	2	42.71	43.23
Uganda	2005		7		42.62
Ukraine	2000	2005	2	28.96	28.21
United Kingdom	2000		2	35.97	
United States	2000		5	40.81	
Uruguay	2000	2005	3	44.56	44.94
Venezuela, RB	2000		3	49.53	
Vietnam	2000	2005	1	35.52	39.16
Yemen, Rep.	2000	2005	4	33.44	37.69

Country	Years Included		Region	GINI 2000	GINI 2005
Zambia	2000		7	53.44	

Appendix 3. Descriptive Statistics for GINI Coefficient for Each Region:

	Region1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7
Mean	39.065	32.635	52.168	37.376	36.685	39.2	44.339
Standard Error	1.237	0.551	0.673	0.981	4.125	3.162	1.066
Median	39.285	32.97	52.22	37.72	36.685	37.085	42.915
Standard Deviation	5.249	4.013	4.257	3.798	5.834	10.000	6.742
Sample Variance	27.548	16.101	18.126	14.428	34.031	100.000	45.455
Kurtosis	-0.692	0.215	-0.717	-0.701	--	3.415	2.279
Skewness	0.005	0.255	-0.273	-0.195	--	1.744	1.124
Range	18.88	18.53	15.28	13.24	8.25	32.55	34.13
Minimum	30.27	24.7	44.22	30.86	32.56	30.72	33.27
Maximum	49.15	43.23	59.5	44.1	40.81	63.27	67.4
Count	18	53	40	15	2	10	40

Appendix 4. Regression including PoliStab (WGI).

OLS, using observations 1-376 (n = 177)
Missing or incomplete observations dropped: 199
Dependent variable: Av5YrGDP

	Coefficient	Std. Error	t-ratio	p-value	
const	6.82	0.85	7.98	<0.00001	***
GINI	-0.09	0.02	-4.77	<0.00001	***
Investment_2	0	0	0.27	0.79	
EduTertiary	0.12	0.03	3.9	0	***
GDP2000US	-0.0001	0.00004	-3.24	0	***
Internet	-0.04	0.02	-2.18	0.03	**
PoliStab__WGI_	0.47	0.23	2.05	0.04	**

Mean dependent var	3.01	S.D. dependent var	2.33
Sum squared resid	729.29	S.E. of regression	2.07
R-squared	0.24	Adjusted R-squared	0.21
F(6, 170)	8.83	P-value(F)	0.00
Log-likelihood	-376.46	Akaike criterion	766.92
Schwarz criterion	789.16	Hannan-Quinn	775.94

Appendix 5. Regression including Corruption (WGI)

OLS, using observations 1-376 (n = 177)
Missing or incomplete observations dropped: 199
Dependent variable: Av5YrGDP

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	6.73	0.91	7.39	<0.00001	***
GINI	-0.09	0.02	-4.81	<0.00001	***
Investment_2	0.00	0.00	0.37	0.71	
EduTertiary	0.11	0.03	3.71	0.0003	***
GDP2000US	-0.0001	0.00005	-2.47	0.01	**
Internet	-0.03	0.02	-1.66	0.10	*
Corruption__WGI	0.18	0.35	0.51	0.61	

Mean dependent var	3.01	S.D. dependent var	2.33
Sum squared resid	746.15	S.E. of regression	2.10
R-squared	0.22	Adjusted R-squared	0.19
F(6, 170)	7.99	P-value(F)	0.0000001
Log-likelihood	-378.48	Akaike criterion	770.97
Schwarz criterion	793.20	Hannan-Quinn	779.98

Appendix 6. Regression including PropRights.

OLS, using observations 1-376 (n = 84)
Missing or incomplete observations dropped: 292
Dependent variable: Av5YrGDP

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	4.51	1.43	3.16	0.002	***
GINI	-0.02	0.03	-0.73	0.47	
Investment_2	0.00	0.00	0.69	0.49	
EduTertiary	0.04	0.05	0.91	0.37	
GDP2000US	0.00	0.00	-0.84	0.40	
Internet	-0.03	0.03	-0.87	0.38	
PropRights	0.00	0.00	-0.66	0.51	

Mean dependent var	3.21	S.D. dependent var	2.02
Sum squared resid	316.45	S.E. of regression	2.03
R-squared	0.06	Adjusted R-squared	-0.01
F(6, 77)	0.85	P-value(F)	0.53
Log-likelihood	-174.90	Akaike criterion	363.80
Schwarz criterion	380.81	Hannan-Quinn	370.64

Appendix 7. Regression including Corruption CPI.

OLS, using observations 1-376 (n = 163)
Missing or incomplete observations dropped: 213
Dependent variable: Av5YrGDP

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	6.73	0.98	6.88	<0.00001	***
GINI	-0.10	0.02	-5.14	<0.00001	***
Investment_2	0.00	0.00	0.45	0.65	
EduTertiary	0.11	0.03	3.45	0.001	***
GDP2000US	-0.0001	0.00005	-2.71	0.01	***
Internet	-0.03	0.02	-1.70	0.09	*
Corruption_CPI	0.13	0.17	0.77	0.44	

Mean dependent var	3.03	S.D. dependent var	2.33
Sum squared resid	669.81	S.E. of regression	2.07
R-squared	0.24	Adjusted R-squared	0.21
F(6, 156)	8.28	P-value(F)	0.00
Log-likelihood	-346.47	Akaike criterion	706.93
Schwarz criterion	728.59	Hannan-Quinn	715.72

Appendix 8. Regression including IncmIneq2.

OLS, using observations 1-376 (n = 178)
Missing or incomplete observations dropped: 198
Dependent variable: Av5YrGDP

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	3.13	0.30	10.41	<0.00001	***
Investment_2	0.00	0.00	0.24	0.81	
EduTertiary	0.13	0.03	4.01	0.00	***
GDP2000US	-0.0001	0.00004	-2.29	0.02	**
Internet	-0.02	0.02	-1.24	0.22	
IncmIneq2	-0.02	0.01	-3.24	0.00	***

Mean dependent var	3.01	S.D. dependent var	2.33
Sum squared resid	809.23	S.E. of regression	2.17
R-squared	0.16	Adjusted R-squared	0.14
F(5, 172)	6.61	P-value(F)	0.00001
Log-likelihood	-387.34	Akaike criterion	786.69
Schwarz criterion	805.78	Hannan-Quinn	794.43

Appendix 9. Regression including IncmIneq3.

OLS, using observations 1-376 (n = 178)
Missing or incomplete observations dropped: 198
Dependent variable: Av5YrGDP

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	-3.45	1.38	-2.50	0.01	**
Investment_2	0.0003	0.0002	1.70	0.09	*
EduTertiary	0.11	0.03	3.49	0.001	***
GDP2000US	-0.0002	0.00005	-3.22	0.002	***
Internet	-0.03	0.02	-2.00	0.05	**
IncmIneq3	0.14	0.03	4.40	0.00002	***

Mean dependent var	3.02	S.D. dependent var	2.32
Sum squared resid	754.36	S.E. of regression	2.09
R-squared	0.21	Adjusted R-squared	0.19
F(5, 172)	9.15	P-value(F)	0.00
Log-likelihood	-381.10	Akaike criterion	774.19
Schwarz criterion	793.28	Hannan-Quinn	781.93