

A New Institutional Approach to Economic Growth

Camilo Arbeláez Toro

Economics Student

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Escuela de Economía y Finanzas

Universidad EAFIT

Michael Jetter, Ph.D

Advisor

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Table of Contents

- I. Introduction
- II. Problem
- III. Objectives
 - a) General
 - b) Specific
- IV. Literature Review
- V. Hypothesis
- VI. Methodology
- VII. Data
- VIII. Conceptual Model
 - a) Theoretical Framework
 - b) Historical Perspective
- IX. Results
 - a) Main Findings
 - b) Robustness Checks
- X. Conclusion and Recommendations
- XI. References
- XII. Appendix

I. Introduction

New institutional economics is a thriving field that gives thought to many relevant questions plaguing the world economy today. At the heart of these challenges, lies sub optimal economic growth for many of the world's poorest countries as well as government obstructions to achieving shared prosperity. Growth factors need to be accompanied by progressive institutions (public) that stimulate incentive based markets where innovation and individual achievement reign supreme.

The intention of this study is to use recent economic theory grounded by new institutionalism in order to assess varying degrees of institutional development and the implications it has for growth. Also, by expanding on Kenneth Arrow's insistence that keen observation must always be present in modern, mathematics driven economics, I showcase a breadth of examples from the past century to the present, to further make my case. Naturally, I rely on empirical techniques based on regression analysis to validate or reject arguments based on literature review and historical analysis of the subject.

I also review the new institutional economics literature primarily from 1990-2012. In addition, it is important to identify various countries that can be exemplified in order to relate institutional development to differing levels of economic growth. This will be instrumental in integrating the conceptual model to possible results from empirical work.

The main findings could possibly provide evidence in line with my *a priori* intuition that good institutions are highly correlated with economic growth. Good institutions can be described as those that stimulate free-market performance, support innovations and technological change, and ultimately guarantee economic freedom and individual liberties. However, it is worth noting that economic growth can happen under extractive institutions such as modern day China, where a politically repressed population manages to obtain a higher quality of living.¹

Each section will consist of specific goals that will lead to conclusions and recommendations at the end. The introduction briefly states the motivation for this project

¹An interesting argument by MIT economist Arvind Subramanian states that the modernization hypothesis is relevant to this discussion about China's future. The modernization hypothesis states that higher living standards will encourage citizen outcries and struggles for a more democratic government.

and delimits the scope of the results that can be achieved. The research question and problem are the baseline for writing a research paper on a specific topic. The problem of study arises from casual observation of economic realities and also from reading the latest and most relevant literature on this particular topic. The objectives are both general and specific, so I explicitly state what is to be accomplished with this work. A literature review section should cover the most important literature and should connect economic theory to the specific, conceptual problem that is trying to be solved. The hypotheses section is especially interesting because I can corroborate an initial “hunch” with empirical results at the end. The methodology details how to proceed with testing my hypotheses and working out a feasible explanation of the problem. In addition, there is a conceptual model that analytically argues as to why this type of study is relevant. Furthermore, this section will be supported by a historical analysis of institutions and some evident consequences for various countries. Reliable data is of critical importance for the success of this analysis and the limitations of data will also be addressed in the appropriate section. Conclusions and recommendations provide relevant insight based on actual results and also certain recommendations or suggestions involving possible social changes to improve certain institutions.

II. Problem

Historically, many political regimes have judged a country’s performance by economic performance. When one studies economic performance, it is natural to calculate GDP growth and more precisely real GDP variations per capita. If one decides to study development, which can translate into prosperity for nations and their respective populations; then it is impossible to neglect factors such as standards of living, perceptions about government, violence, and expropriation risks, among others. Since new institutional economics addresses issues related to poverty, failed states, corruption, inequality and many others; it makes sense to incorporate this theoretical backbone into the empirical model which will try to gain further ground for this institutional approach to growth.

Many approaches to growth consider factors that are not consistently significant in describing why some countries prosper while others fail. For example, some scholars have

studied the importance of geographic factors, cultural factors, religious factors, natural endowments, population size, and others in order to sketch out a plausible theory about growth. If some of these factors do prove significant, it is a mere coincidence and not a holistic truth concerning growth (Acemoglu, Simon, and Robinson, 2000). Testing for good institutional development in regard to sustained economic growth would shed light on a better way of understanding the economic outcomes of nations. By carefully reviewing new institutionalism and its literature, it should be possible to work out a solid theoretical foundation regarding good institutional development and positive economic outcomes.

III. Objectives

a) General

The main objective of this paper is to study new institutional economics as the main economic theory behind institutional development that leads to the long run economic growth of nations.

b) Specific

The paper consists of a new institutional economics literature review largely from 1990-2012 that argues for the relevance of institutional development in studying economic growth. Also, the economic theory behind institutional development advocates the necessity of thoroughly understanding and articulating historical factors with institutional realities and their impact on growth. Furthermore, the relation between institutions and growth must be tested, and an empirical model is to be estimated to corroborate new institutional theory.

IV. Literature Review

Economic growth can pertain to both industry analysis or also to macro level studies. In the latter case, the main interest revolves around country level data and specifically what degree of institutional development can be attained. The sample data will include all available data for all countries and all available time frames. Since it is a macro level

study, most of the variables will be well known to readers but perhaps most will not be aware of the magnitude each variable can have on a final outcome.

The conceptual model will be grounded on the fundamental theories of new institutional economics. Clearly, good institutions will better equip countries for economic success and prosperity in the long run (Acemoglu, Simon, and Robinson, 2000)². The central thesis behind this is that adequate institutions secure property rights and the sanctity of contracts, which are prerequisites for innovation and entrepreneurship. It is important to stress the idea of a long run perspective, because many policy makers have been deceived by short-term gains while completely ignoring structural flaws. More specifically, this argument can be evidenced by governments' decisions to assure central bank independence to avoid political manipulation or temptation to shoot for short-term growth during election periods. Economic success naturally depends on factors such as foreign direct investment as mentioned by Cárdenas (2009). Also, expropriation risks have large economic implications for many countries that demonstrate these tendencies. Governability indexes capture how well a government can exercise authority based on its institutional power to deliver public goods to its population. I can be more specific in defining good governing ability by adhering to the guidelines laid out by The World Bank (2009) which stress the following:

- 1) The degree to which citizens can actively engage in and participate in official elections, freedom of speech, and media and communications.
- 2) Political stability, absence of criminal activity, and terrorism as perceived by citizens. This view takes into account the probability of a government being overthrown by criminal or rebellious behavior.
- 3) The effectiveness of government in delivering public services and civil service. This indicator also assesses government credibility and governments' transparency and commitment to fulfill and deliver on promises.
- 4) The measure of the absence of fiscal burdens which detriment private sector initiatives and incentives to invest and create.

² Non-extractive institutions that elevate welfare and encourage a competitive market place where corruption is minimal and property rights are guaranteed.

- 5) The measures of citizens' perceptions of government ability to assure legal sanctions, property rights, impunity, among others. It basically results in a trustworthiness indicator to determine if a government truly acts in the best interest of its citizens.
- 6) Perhaps the most common of all: corruption perception. This indicator attempts to quantify not only direct government corruption but also corruption levels of "elites" or some private sector agents.

The Institutional approach to economics can be traced back to Thorstein Veblen, although Ronald Coase is better known for relating economics to law and studying institutions and their economic outcome. For starters, Coase (1937) and the approach to externalities known amongst economists as the Coase theorem has allowed researchers to expand on the importance of property rights. The theorem states that when there is a conflict concerning property rights, individual negotiation and bargaining leads to a better, more efficient outcome than any particular assigned property rights. Basically, the principle assertion behind the Coase theorem believes a competitive marketplace will dictate which firm is able to oust the other and property rights will not deter an optimal solution to this game theoretical problem.

Following the work of Coase, Douglas North, a Nobel Laureate as well, has extensively written and expanded on property rights and how adequate enforcement provides necessary incentives for economic activity. Also, there are primitive ways of life that do not relate to the concept of private property North (1991) because land is believed to come from nature which intuitively means there is no individual ownership but instead the collective use for common benefit. For example, many Indian tribes in Colombia are greatly ostracized; therefore they find comfort among themselves. In their society, they strive to produce food and to earn distinction among their peers; they do not however have incentives or many opportunities to compete and earn their place in Colombia's market-based economy.

In newer literature, primarily Acemoglu (2008) and Robinson (2008), argue that institutional development is the main driver behind long-lived prosperity. A striking

example of this is the Soviet Union meltdown after decades of incredible economic performance. The leading politicians and policymakers of the day feared losing power and decided to regulate and keep a tight grip on innovation and technological change. Again, the main point rests with the idea of inter-temporal choices and present sacrifice for greater benefit in the future. Although enticing to reap benefits today, proper institutional development requires constant change and innovation that gives way to a dynamic economy where free market incentives always persist. Schumpeterian economics is based on technological change bringing about “creative destruction” where the newer, more efficient methods leave the old aside in a constantly evolving and competitive society. This model critiques modern day China and how strong central planning can lead to a path that resembles the late Soviet Union. Perhaps the most relevant arguments in favor of an institutional approach to growth are put forward by Acemoglu (2008) and Robinson (2008) in using real world examples to justify that cultural, religious, geographic, natural resources, and other barriers are not the fundamental explanations of why countries fail or succeed in the long run. Empirical models that test for the significance of institutions need to include key variables such as: corruption, expropriation, political risk, property rights, democratic freedom, and other institutional development indicators (Aron, 2000).

To summarize, the role of institutions in economic growth and development can be notably traced to Douglass North and his contributions that earned him a Nobel Prize in economics. Ronald Coase is best known as the founder of new institutional economics, and also expanded on critical elements of institutional success, which include property rights, contract enforcement, etc. Specifically, the argument for the critical role of institutions for long run economic performance, sustainability, and development is written North (1990) in a seminal work of Douglass North.

“I wish to assert a fundamental role for institutions in societies: they are the underlying determinants of the long-run performance of economies – Third World countries are poor because the institutional constraints define a set of pay-offs to political/economic activity that do not encourage productive activity.”

More recently, the disciples of this school of thought include Daron Acemoglu, James Robinson, Simon Johnson, and Dani Rodrik. For instance, North (1990) and Olson (1982) argue that absence of secure property rights and contract enforcement, discourages investment and specialization. Furthermore, Acemoglu (2008) and Robinson (2008) insist that extractive institutions that serve an elite prevent economic transformation in the form of “creative destruction”, technological innovation, and industrial reconversion. An interesting input Rodrick (2008) specifically declares why institutions must exist to give way to economic activity: “markets require institutions because they are not self-creating; self-regulating; self-stabilizing; or self legitimizing.” In essence, institutions are the groundwork for innovation, productivity, and interactions between individuals, government, society, etc. Furthermore, Bardhan (1999) and Udry (1999) shed light on the difficulties for bringing about institutional change. They argue that collective action problems spawn conflicts arising because of vested interests, the free-rider problem (a classic approach to social conflict in microeconomics), and bargaining problems also studied by Robock (1971) and De la Torre (1981).

The growth literature is also of great interest because growth can be a *proxy* for development and has been frequently modeled given different explanatory variables. The beginning of growth literature is clearly marked by Solow (1956) and the neoclassical growth model where capital (K) and labor (L), and ultimately the combination of these; result in productivity and output. The variable A represents the technology parameter commonly found in the growth literature.

$$\text{GDP} = f(A,K,L) \quad (1)$$

The empirical literature on growth can be traced to Barro (1991), Romer (1986; 1990), Mankiw (1992), Durlauf, S. N. (2008), Kourtellos, A. (2008), Tan, C.M. (2008), Henderson, D.J. (2012), Papageorgiou, C. (2012), and Parmeter, C.F. (2012) as recognizable authors in contemporary economics. The growth functions included in these papers acknowledge the presence of human capital as building blocks for growth in the long run. Growth can be separated into two blocks: short term growth, where macroeconomic

stability is essential, and long term growth where Solow's neoclassical function is the pillar for any discussion. The neoclassical approach also takes into account the Inada conditions (1963), which are extremely important in achieving long run growth considering steady state constraints for all nations.

$$\lim_{k \rightarrow 0} f'(k) = \infty \quad \text{and} \quad \lim_{k \rightarrow \infty} f'(k) = 0 \quad (2)$$

$$\lim_{L \rightarrow 0} f'(L) = \infty \quad \text{and} \quad \lim_{L \rightarrow \infty} f'(L) = 0 \quad (3)$$

Basically, if capital accumulation tends to infinity, returns on capital will dwindle and tend to zero. Countries with low productivity and factor accumulation can rapidly experience huge gains in growth as they close the gap on more advanced economies.

V. Hypothesis

Better institutions (that allow for individual achievement and technological change), which translate into non-extractive institutions, allow countries to present higher levels of growth and prosperity for its people. Extractive institutions may be able to attain wealth or even economic growth but this may not be sustainable and may not lead towards long-lived prosperity. Extractive regimes do not make short-term sacrifices nor do they promote technological change that might threaten their rule. Countries that have institutions that stimulate creativity, individual liberties, and market-oriented incentives are better suited for economic growth (North, 1991). Better yet, countries that present better institutional development will have a higher GDP over the long run than those that do not.

VI. Methodology

The empirical aspect of this paper provides evidence based on streams of thought that propagate through the new institutional economics literature. After conducting a literature review that gathers evidence that institutions affect growth and long run economic performance of nations, I propose a model that could shed light on these arguments.

Therefore, I follow econometric measurement specifications as proposed by Mirestean and Tsangarides (2009) to identify a basic empirical growth model consisting of cross-country panel data using OSL estimation methods. The use of panel data sets is advantageous Pindyck and Rubinfeld (1998) compared to cross-section models and traditional time-series analysis in studying a dependent variable's overall change or specific change, for instance a given country's change. The equation will have growth as the dependent variable and the econometric specification will be as follows:

$$Gr_{i,t} = \alpha_0 + \alpha_1 * X_{i,t} + \alpha_2 * Inst_{i,t} + \lambda_i + \beta_t + \varepsilon_{i,t} \quad (4)$$

where $X_{i,t}$ denotes a vector for control variables that includes initial income, investment, debt, population growth, inflation, life expectancy, and openness to trade, which are found to be the remaining robust determinants of growth as suggested by Miresteans and Tsangarides (2009). The *Inst* variable denotes my measure for institutional development via a *proxy* variable known as the Polity IV variable, which will be discussed in more detail in the following (data) section.

Conceptually speaking, institutions are characterized Rodrick (2000) as follows: property rights and legally binding contracts, regulatory institutions, institutions for macroeconomic stability, social insurance institutions, and institutions of conflict management. Property rights are considered an important condition for asserting the level of institutional development found in a particular country (North, 1991). Economic freedom should be at the core of the model, because of the value it places on institutions and the impact more democratic societies could have on economic growth. Also, freedom from corruption, social capital, government accountability, and patent rights are part of the key to capturing institutions.

The Wall Street Journal and The Heritage Foundation define economic freedom as “the fundamental right of every human to control his or her own labor and property.” This basically states the underlying motives behind a free market economy, where market forces driven by incentives and rational individual agents become the norm for society.

Macroeconomic stability is accounted for in this model, where I will use inflation (GDP deflated) as a measure of short-term stability, or the central component of short-term growth. Conflict resolution or social interaction is very distinct and cannot be generalized, since it depends on country heterogeneity factors such as religion, tradition, culture, etc. This will be accounted for Mirestean and Tsangarides (2009) by including country fixed effects for unobserved heterogeneity, robustness checks that include time trends, multicollinearity tests, outlier filters (for countries that present growth rates greater than 15% or lower than -15%), and lagged explanatory variables to correct for reverse causality problems common in the growth regressions.³

Specifically, the variables to include in the model are real GDP per capita (as proxy for measuring prosperity or success), investment, inflation, debt, openness population growth, life expectancy and a measure for institutions (degree of democratic or autocratic governance). These variables are carefully selected based on seminal works in the growth literature Mirestean and Tsangarides (2009), but there is also an innovative approach that seeks to capture the relevance of institutions for the economic success and prosperity of nations. Also, I justify selecting the control variables proposed by the latter authors, because they conduct a rigorous econometric analysis of 42 variables frequently included in growth regressions. Their paper concludes that these seven variables are the only ones remaining robust after accounting for endogeneity, model uncertainty, and dynamics.

VII. Data

The data set includes all available data (1960-2011 for most control variables), which will attempt to be robust in nature. Also, I take five-year averages to filter out business cycles (usually lasting 3-5 years) that increase volatility in short term growth, which distracts from the long run focus of this model. Furthermore, I will construct a generic, unbiased model that clearly models growth for all countries without special

³ See (Temple, 1999). Model selection is also a well-known problem in the empirical growth literature.

treatment to factors such as geography, climate, resource abundance, and others. The final sample includes 214 countries with available data to include in the regression. The data sets will be constructed from sources freely available on the web. These sources include: The World Bank Data, the Penn World Tables, and the Polity IV Index (specifically the Polity2 variable).⁴ The Polity IV index is an extensive time series data set going back to the 19th century and including measurements of democratic or autocratic presence in most countries.

Table 1

Polity2 Variable Specification

Interval	Denotation	Meaning
From -10 to -6	Autocracy	Citizens' participation and political engagement is largely suppressed.
From -5 to 0	Anocracy (closed)	Citizens are subjected to the rule of "elites" and central authority is weak; political instability.
From 1 to 5	Anocracy (open)	Elites are in power but there is a more central rule that reduces instability.
From 6 to 10	Democracy	Citizens can actively engage in political arenas and are entitled to economic and civil liberties.

5

I choose the Polity IV variable based on multiple reasons. First, the model looks to capture the long run effects of institutions on growth, so it evidently needs a long time series. I considered using the variable property rights from the Heritage Foundation data set but was constrained by limited data before 1990. The Polity IV variable dates all the way back to the 19th century, which is perfectly suited for growth analyses. The Polity IV variable is essentially a condensed version of the Polity variable with a slight "fix" that makes it a better match for time series analysis. It is better for time series analyses because the variable is on a smaller scale (-10 to 10), aiding in time series stationarity, while

⁴ The Polity2 variable is normally referred to as the Polity IV variable in the literature. I will refer to it as Polity IV throughout the paper, although it is labeled Polity2 in the annexes.

⁵Source: Global Report 2009: Conflict, Governance, and State Fragility

dropping observations with no data. The general classification of regimes includes: interruption, transitions, and total collapse. Interruption periods, for example, can be temporary military occupations during war times. Total collapse periods include events such as in Lebanon (1978-1986) where the central government rule was so diminished it only exercised authority in a few blocks of Beirut. Transition periods are viewed rather favorably for the construction of this index, because transitions often lead to more democratic initiatives that lead to more inclusive societies. More specifically, the Polity IV variable is considered an accurate *proxy* for institutions because it captures the notion of economic and civil liberties, which are at the core of free market economies and incentive oriented competitive marketplaces. Although one variable cannot account for every measure of institutions, rating political regimes is a reasonable approximation for identifying good institutions as well as poor institutional development (Marshall and Cole, 2009).

VIII. Conceptual Model

a) Theoretical Framework

Although it is vital to use data to assess the impact of institutions on growth, it is also critical to state concrete economic realities. Classical and neoclassical growth models such as Solow and Ramsey have come up short in explaining why certain countries fail to grow. Some countries with adequate factor accumulation, i.e. capital accumulation and productive workers, do not present successful economic outcomes. Saudi Arabia presents a vibrant economy because of high oil prices, even if many citizens' welfare is not improved. The "modernization theory" implies that greater economic achievement will translate in a country's cry for democracy and economic and civil liberties (Acemoglu & Robinson, 2012). This is often not the case, because some countries achieve economic gains not because of increased productivity and technological change but instead boast good results based on the findings of precious, natural resources. For example, Venezuela may achieve increased oil exports and better revenues due to oil prices, but high oil prices represent wealth for an elite and do not magnify on the whole population because of the presence of "extractive" institutions. On the other hand, if a nation changes its productive scheme to

create greater incentives for workers, better living standards, than this will potentially live up to the modernization theory of bringing about change.

Long-term growth is an indispensable prerequisite for better country performance down the road. A country must grow to elevate its GDP per capita and to bump up share in world trade. Furthermore, international trade is essential for all nations in a globalized world. China has been very successful in recognizing the forces of globalization and using it in its favor. China has a large population, which can produce goods at low costs, and compete in many markets around the world. Many high middle-income countries such as Brazil may get caught up in what Michael Spence calls a “middle-income trap.” What this means is that rising wages will decrease marginal profits and competitiveness will be evaporated both domestically and abroad. This middle-income plight plagues many emerging countries that need to survive this phase in order to enter the developed world. Emerging economies must aspire to high institutional achievement in order to constantly create new investment opportunities to escape from this trap. China is pressing ahead, in essence, due to its relentless attitude towards “catch up growth.” If China’s GDP is far from its steady state, then it can potentially grow at rates close to 10% and close the gap on the U.S. economy.

Institutions as captured in my empirical model range from democratic to autocratic. Democratic institutions can spawn technological change, encourage foreign direct investment, and catapult nations to higher standards of living. This has to do with market incentives and open economies. China is a very interesting example of economic success (high growth rates, autocratic rule, and technological initiative. Much has been debated about intentional Chinese devaluation of currency in order to compete abroad, and other unorthodox maneuvers that make it the unique economy that it is. There are perhaps two possible outcomes for China:

- 1) It will live up to the “modernization theory” when Chinese workers begin to demand a higher standard of living and more freedom
- 2) It is living a phase of “catch up growth” because of its previous dormant economy shut off to foreigners.

Empirically, models will not relate well to the China effect, but for robustness effects, African countries normally present strong evidence for institutional struggles negatively affecting growth and deteriorating general levels of well-being. India is a more democratic than China but does not match China in its unparalleled growth rates for different reasons.

Table 2 The China vs India Dilemma

China	India
Distinct autocracy, central rule is supreme	World's largest democracy, but plagued by corruption
Growth rates around 8-10% GDP	Grows at approximately 6-8% GDP

6

This case is a baffling conundrum because more democracy does not seem to translate into higher growth rates in the short run. This is perhaps the most cited counter example to institutional approaches to growth. The heart of the question is definitely the long-term sustainability aspect of China's remarkable growth. Many argue there might be a bubble phenomenon in China, while others argue catches up growth, or many decide to attribute this success to sheer numbers and size. China has the largest population on Earth and can generate powerful internal demand for goods and services, which enables the economy to push through global economic setbacks.

African countries are at the center of all discussions related to inequality, poverty, and slow growth. The geography theories are not too compelling in Africa because African countries are blessed with great natural endowments that high growth southwest Asian economies can only dream about. Analytically, institutions need to be studied from a historical perspective, because the historical factors ultimately determine present outcomes. African countries mirror many Latin American countries in civil strife, corrupt governments, fear of creative destruction by elites, among many other characteristics. Natural resources can artificially boost an economy when prices for these are high, but it is

⁶ Own Construction

not a fundamental determinant of growth because it does not breed greater productivity or technological progress. In fact, Jeffrey Sachs has argued for a “natural resource curse” in Africa, which means that having access to plentiful resources becomes burdensome for some countries.

An interesting case of natural resources providing an economic boost and then more inclusive economic institutions is the case of Botswana. This southern African country became a diamond powerhouse in the 1970s and the government was very diligent in using its increased revenue to improve its fiscal balance sheet and increase government spending in productive fashion (Acemoglu and Robinson, 2012). Botswana’s economy improved and better institutions allowed the country to develop more desirably than its African counterparts Sierra Leone and Angola. So, natural resources are obviously positive for a country because it can harness its fiscal base and invest in projects that can produce long-term gains. Furthermore, they can also be a “curse” as Jeffrey Sachs has notably stated because it produces perverse incentives for elites to extract and ignore productivity as a whole (Warner and Sachs, 1995).

b) Historical Perspective

Over the last two hundred years, Latin America and the Caribbean regions have struggled in developing growth patterns similar to their North American and European counterparts. Although Mexico and Peru were once home to the greatest civilizations in human history, those days brushed past as the Spanish Conquistadores arrived in the region during the sixteenth century. The mighty Aztec and Inca Empires were rapidly deceived and soon conquered and forced into organized labor. The case of Latin America is very interesting because there is a structural shift from a notable civilization to a poverty stricken continent. Furthermore, North America also experimented with a similar trend but headed in a different direction. North America initially had a more scattered, primitive society based on hunter gathering in order to subsist. However, the 18th century for the North American continent was instrumental in transitioning a sleepy economy into a world power on political and economic fronts.

Many questions have puzzled economists, geographers, political scientists, and historians about the growth divergence of the Americas. To state it bluntly, North America steered North and South America pulled South. Many hypotheses have been discussed regarding the economic differences between the two sister continents. These possible explanations have pinpointed issues concerning geographic factors, climate factors, cultural factors, and even biological and evolutionary based arguments. Some economists such as Jeffrey Sachs have adhered to the hypothesis of hot, tropic climates correlating with the poverty and poor development of Haiti, the Dominican Republic, and many others. Evolutionary biologists are quick to quote Darwin and state that all species react and adapt to their environment and social encounters. These arguments can surely correlate with economic realities but are scarcely ever empirically proved.

Clearly, functioning institutions are the epicenter of advanced countries with good governance and enviable levels of welfare. If neighboring regions of the world display substantial developmental divergences, this simply cannot be explained by geographic factors or natural endowments. Ironically, countries that are resource blessed display horrible, corrupt institutions that do not promote equality and do not bring about progress for its general population. Many oil-producing countries are “rich” if and only if oil prices remain high and stable in the foreseeable future. Saudi Arabia and Kuwait benefit amply from bountiful oil possession but their neighboring countries Egypt and Syria tend to be more corrupt and devastatingly poor (Acemoglu & Robinson, 2012). The leading scholarly consensus (while considering constant factor accumulation) on why some nations are wealthy while others are extremely poor can be attributed to varying levels of institutional development.

Until the Inca and Aztec Empires came into contact with the Spanish, they had developed a very unique and advanced society for their time. The people of these empires did not live in chaos and constant feuding, but rather venerated an emperor and built a society similar in hierarchy to the Roman Empire. North America was never home to a dominant empire, but was populated by Native Americans of Asian descent who presumably crossed the Bering Strait from one continent to the other before continents began to drift apart. These new populations in North America were self-sufficient

communities that relied on hunting and fishing to survive. They never united with other tribes under a single banner, yet these tribes lasted for centuries before the arrival of the Europeans.

The arrival of Spaniards in South America soon translated into an authoritarian regime and a mercantile-based economy. The Spanish exploited the natives and disguised Christian preaching while exploiting and savagely extracting gold and silver from the land. The Spanish monarchy was set on conquering the Americas and using its riches to build a powerful Spanish Empire that could control the seas and dominate international commerce. At the time of the Spanish plunder of Latin America, England was a mere European country struggling to fall apart due to Wars of the Roses which was bloody and prolonged civil war. In effect, Spain was a world power during the fifteenth century and evidently beat the English in conquering the Americas.

The comparison between political and social developments in North America and Latin America illustrate significant outcomes. For instance, the Spanish monarchy is relatively more absolutist, centralist, and authoritarian, which breeds inequality among its citizens (Ocampo, 2007). The English legacy in America is based on meritocracy, competency, and the liberty of profession, private property, and social progress. Many theories have arisen loosely explaining economic realities among nations based on cultural, demographic, geographic, and climatic factor that do not adequately justify economic performance.

There is no empirical evidence strong enough to affirm that geographic factors make a difference in affecting growth. Most people are aware of the dissimilar paths taken by the two Koreas after the Demilitarized Zone was installed in 1953 (Acemoglu & Robinson, 2012). North Korea has been an oppressive, communist country that has extracted economic benefit for the elite at the cost of poverty and inhumane conditions for the general population. Contrary to this story, South Korea has grown impressively since the DMZ divide and its living standards rival that of any developed country in the west. There is no relevant geographic, cultural, demographic, or even religious difference between these two nations that would empirically support divergence in growth. What is truly evident is the opposite institutional arrangements that allow South Korea to have an incentive-based

economy where individuals are motivated to achieve higher education and finally to seek success in the workforce. Extractive institutions such as the one led by the North Korean government, antagonizes individual liberties, incentives, and the accumulation of capital and productivity gains. A bizarre case of growth under extractive institutions is the Soviet success story under tight communist rule. This regime achieved growth over several decades, but eventually collapsed because there was no “creative destruction” or materialization of innovative technologies that would replace obsolete business models. What is the point of educating oneself, starting a business, if no profits will ever be enjoyed by the entrepreneur under poor institutional presence?

Another interesting case that alludes to Table 1 are the distinct differences between English and Spanish legacies in the Americas. Although, the English legacy in North America prevailed in setting up successful institutions that wholeheartedly embraced the Industrial Revolution, this was not to be the case in other parts of the world. English colonies such as Barbados, Nevis, and Jamaica have been poverty stricken and often corrupt over the course of history. So, the idea that cultural or historical influence is a factor in achieving growth does not receive overwhelming support. Besides, the British Empire dominated the seas in the 18th century and where able to travel, conquer, and plunder around the globe.

The English people suffered enormously during the Middle Ages where they were frequently invaded and conquered by nomadic tribes or the Spanish. The Bubonic plague in the 14th century wiped out one third of Europe’s population and devastatingly struck the English people while many implored the contrary. This plague that began in China and rapidly spread through contact with European traders along the Silk Road was a testament of weak medical and biological knowledge at the time concerning plagues, epidemics, and diseases. Britain was very poor and disorganized for much of the Middle Ages and even at the time of the Spanish *conquistas* of Latin America. Moreover, the English did not colonize North America because it was a nicer piece of land, but because Latin America was already Spanish territory for centuries.

Table 2: Historical Basis Of Contrasts Between the Economic and Political Systems of the United States and Latin America

HISTORICAL FACTORS	NORTH AMERICA	LATIN AMERICA
Colonial Emigration Policy	Unrestricted as to nationality and religion.	Limited to Roman Catholics loyal to the crown
Profile of European Colonists	Farmers and tradesmen; arrived with wives or families, prepared to settle permanently	Peasant soldiers; sought to return after making a quick fortune; intermarried with native women
Profile of indigenous inhabitants	Loosely organized, egalitarian; small population	Complex and stratified social structure; large population
Population growth	Rapid	Initially negative, then slow
Primary labor force	European colonists	Indigenous and African slaves
Religion permitted	Any Christian denomination	Roman Catholic only
Independence significance	Popular revolution against economic and political repression	Changed only lyrics of economic tune; elitist musical score remained unchanged
Access to power	Through impartial law	Through personal patronage
Responsibility for one's welfare	Individual	Boss and in-group
Hiring and promotion criteria	Performance and skills	Family and social background
Social governance basis Government Type	Rule of law Federalist power	Rule of men Centralist power
Primary role of military	Defend against external threat	Defend against internal threat

⁷

⁷ Own Construction

The Industrial Revolution is a fascinating period of time because it is an inflection point in history of economic growth and development. Before the Industrial Revolution, growth was not a priority or even an economic model of any sort. Sure, the Mayan civilization was very successful for its time, or even the Roman Empire conquered much of Europe and spread into Africa; but they never achieved sustained growth. The concept of sustained growth is one that underpins the theories behind successful institutions.

When the Industrial Revolution was in full throttle, it brought about changes in production, labor organization, management strategies, and the role of government, including many others. Perhaps the causes of the Industrial Revolution can be traced throughout history in the societal development that allowed nomads or travelers to settle and become sedentary people. From sedentary life, human populations began to grow, especially during more peaceful times, as was the case in 18th century England. As populations grew, then so did cities and industrial activities.

So why did the Industrial Revolution take place, and why in Great Britain? Many academics have suggested cultural, historical, and non-economic factors to pinpoint the Industrial Revolution to Great Britain and why in Glasgow instead of Paris. There are ongoing debates divided into two main streams of influence: the economic grounded arguments and the non-economic factors that could have influenced the Industrial revolution. Significant technological advances included the spinning jenny, the steam engine, coke smelting, and many others marked by this English revolution. If one adopts a microeconomic theory grounded argument, it is important to note that England had high real wages in the 18th century, accompanied by low prices for capital and energy goods (Allen, 2010). The implications of this assessment include that individuals had a strong purchasing power, while enterprises had clear incentives to invest in capital and technology due to cheap prices compared to other countries in Europe. England evidently decided to take the lead and invest in technology, which consequently provided innovations and huge gains in productivity.

It is important to note that the expansion of factories, labor efficiency, and increased output were vital determinants of this revolution. English factories adopted what would later surge formally as “Scientific Management” proposed by American mechanical engineer

Frederick Taylor. He emphasized efficiency, automation, compensation incentives, and cost reductions via technological improvements.

Microeconomic theory is helpful in understanding why businesses chose to invest and in explaining why new inventions were marketable and profitable. Technology was expanding on both sides of the supply and demand equation. Low prices spiked demand for technology because it would make work easier and perhaps increase leisure time for business owners. On the supply side, higher wages translated into more education, improved lifestyles, and a stronger consumer market. Management theory is helpful in understanding how economic incentives were effectively used inside the workplace to motivate employees and to create a new group of powerful consumers.

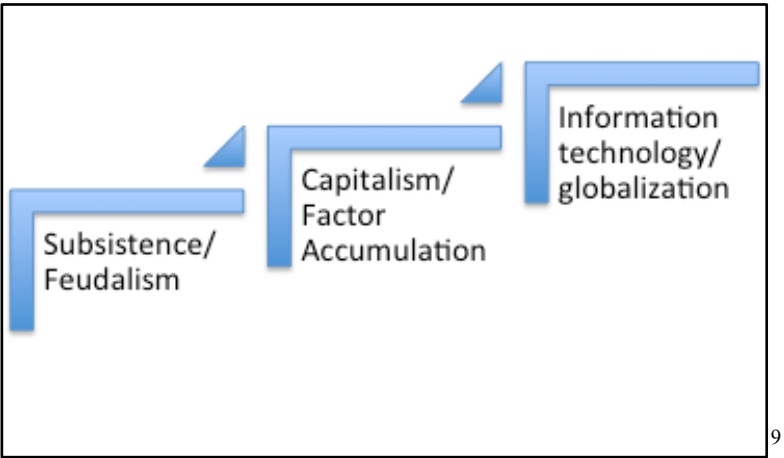
Taylorism was not yet incorporated into formal language, but the Industrial Revolution created harsh work environment for the working class since for the first time in history, workers took to the cities and to factory life.⁸ Quite noticeably, harsh work environments and mind-bending, long shifts were put in place at this time, because only in the 20th century would business leaders begin to consider organizational behavior, work environment, and non economic motivational factors that are instrumental to business success. It makes perfect sense why the Industrial Revolution bred great economic prosperity for Great Britain, but also why the Marxist doctrine quickly arose in protest. Never before had mankind witnessed the ability to constantly accumulate capital and to boost productivity. Karl Marx would protest that exploitation and salaries near subsistence levels were the result of this magnified capitalism that would eventually lead into crisis or recession. It turns out capitalist societies are governed by boom and bust business cycles, but they do lead to highly competitive market places that boost innovation.

The Industrial Revolution analysis leads to an exciting framework where the world economy splits into two: the before and after. Perhaps institutions have become relevant in market-oriented societies of today, but were not so important in the past. When I mention institutions, I refer to and emphasize economic incentives as the drivers of shifting the

⁸ Taylorism is a management theory that emphasizes economic efficiency and labor productivity without taking into consideration human relationships, employee happiness, well-being, and other non-monetary incentives.

supply curve to the right and catapulting productivity to all time highs. In closed economies, economic competition is naturally less fierce than in open, globally integrated markets. Tribal societies of the past based on subsistence economies or barter economies were not affected by positive or negative institutional inputs. These societies were surely affected by clan disputes, wars, and aggression that severely deteriorated their way of life. Institutions in the past were critical to maintaining order, harmony, and balance in society. They were not however a decisive factor in economic growth, simply because societies had not evolved into measuring and competing in free markets.

Chart 1 Evolution of Economic System



I previously mentioned economic growth before and after the Industrial Revolution, that basically refers to Adam Smith’s novel work in *The Wealth of Nations* where capitalism as we know it was born. Division of labor, capital accumulation, supply and demand, and competition were the fundamental determinants of economic growth and the long run success of nations. This theory continues to be the leading economic theory that encourages free markets, basic government intervention, and international trade.

Recent forces as those mentioned in step three of the Chart 1, indicate that times have changed since Adam Smith. Information technology and innovation are accelerating at unprecedented rates, while global integration and capital flows are more articulated than ever before. Just a casual observation of the Colombian economy shows that 80% of

⁹ Own Construction

exports are heading towards the U.S. and Europe. In the 18th century Europe traded with Middle Eastern and African countries but time and distance made inter-European trade the logical path to pursue. In today's world catch-up growth and knowledge transfer are crucial factors in the world economy. These create dynamics because globalized economies that are largely integrated can learn from their peers rapidly and at diminishing marginal costs, which lead to spillover effects and externalities. Some notable examples are China, Brazil, South Africa, India, and essentially the emerging market economies that continue to grow at an alarming pace.

Large, developed economies such as the U.S., Canada, France, the United Kingdom, and others cannot grow at the pace of India. They are close to their steady state and are developed, world powers that reach diminishing marginal returns for factor accumulation. As emerging economies transition into advanced country status, the existing developed countries can potentially begin a renovation period of high growth due to the beginning of new technologies and less knowledge transfer. This knowledge transfer creates what Spence (2011) calls the convergence of nations. He argues that high-speed growth economies face potential financial crises fueled by exhilaration from growth and high leverage in capital markets. These countries need to balance this high-powered growth with caution and regulatory evolution so that they do not spin out of control and create a crisis similar to 2008 that radiates on a global scale.

Why is catch up growth and economic convergence important? It is significant because it means that in a global economy it is easier for countries to learn from others and possible that emerging economies will eventually equal they're once innovative, and creative peers that generated great knowledge and consequently substantial wealth. Essentially, institutions should converge so that growth and distribution of the former can be optimal. Institutional development is not steering in the path of convergence, but rather many dissimilar institutions are being installed possibly because of large economic incentives.

Emerging economies and advanced economies will likely converge in the future and reach new heights of wealth. Poor countries will lag behind because of corruption and detrimental institutions and finally economic prosperity is bound to diverge. By referring to

one of my previous points about “creative destruction,” I can make a case for divergence between emerging country growth and underdeveloped country growth as deriving from knowledge transfer. Emerging economies obviously want to grow and benefit from knowledge transfer in order to close the gap with advanced economies. Countries rampant with corrupt governments and failed institutions extract wealth and have no interest in creating political risk for their own regimes by allowing knowledge transfers, globally integrated communications, no Internet censorship, etc.

IX. Results

a) Main Findings

The empirical model suggests good institutions, as discussed throughout the paper, positively affect growth. The initial hypothesis was grounded on a review of the literature and an *a priori* understanding of the subject matter that led this paper in the direction of modeling the Polity IV variable against growth. In the annexes that follow, I show that institutions as captured by the Polity IV variable prove to be significant at the 1% level. Precisely, the main results table (below) shows 1% positive significance levels for all six specifications displayed. The first regression models the Polity IV variable against growth, and the following regressions subsequently add a new independent variable until including the entire model specification as expressed in equation (4). This regression table includes country fixed effects for all six regressions and the Polity IV variable proves to be significant on the 1% level in all six specifications. I acknowledge institutions can be accounted for with multiple variables and it is possible that one specification can produce results that differ from another. I was able to confirm Acemoglu *et al* (2001) where institutional development is a key driver for growth as displayed in the main results table below.

***Main Regression Table with Country Fixed-Effects (dummy variable)

	(1) Rate	(2) Rate	(3) Rate	(4) Rate	(5) Rate	(6) Rate
POLITY2	0.114*** (0.023)	0.115*** (0.023)	0.112*** (0.022)	0.104*** (0.023)	0.092*** (0.025)	0.101*** (0.024)
II		-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
GCF			-0.046* (0.021)	-0.042* (0.021)	-0.049* (0.023)	-0.051* (0.024)
POP				-0.293 (0.175)	-0.268 (0.185)	-0.236 (0.192)
LE					0.028 (0.025)	0.028 (0.022)
INF						-0.001 (0.000)
OPEN						-0.001 (0.006)
_cons	1.673*** (0.210)	0.881*** (0.019)	5.984*** (0.637)	2.298*** (0.580)	0.566 (1.508)	1.795 (1.507)
N	1258	1204	1133	1133	1133	1110
R-sq	0.281	0.350	0.384	0.388	0.389	0.398

Standard errors in parentheses

* p<0.05,**p<0.01,***p<0.001

Aside from the Polity IV variable, I naturally followed the regression specification as proposed by Mirestean and Tsangarides (2009) and was able to confirm most results from economic theory. Capital gross formation as a fundamental variable in the Solow-Swan model proved significant in all four specifications presented in the following table, where one can see how a 1% increase in GCF translates into a 0.077% increase in growth. This was to be expected because capital accumulation and factor accumulation are essentially the underlying economic principles behind long run economic growth as expressed in equation (1).

The main regressions table displays 5% positive significance for GCF under five different specifications. Also, this was verified by using fixed effects and a balanced panel data set that drops countries for which there were observations lacking within the time period 1960-2011 and the results were also positive at varying significance levels as shown in the (Balanced Panel Data Set) table (below). Incorporating balanced panel data is advantageous (see Wooldridge, 2006, for instance) because it minimizes biased estimators that may result from unobserved factors that change over time. Regarding openness Andersen (2008) and Babula (2008) review the most cited empirical analyses and find that openness is positively significant but particularly for developed countries that can readily benefit from trade liberalization. Countries with underdeveloped institutions, property rights, economies of scale, i.e. are not likely to benefit from increased trade exposure.

Life expectancy can have a positive effect on growth when impact on technology and human capital is large, and when diminishing results are limited (Acemoglu and Johnson, 2007). Reverse causality (where y affects x , just as x affects y), is highly prevalent in growth regressions and I ran regressions using lagged variables in an attempt to correct for this specification problem (see Temple, 1999, for a discussion of using lagged variables). It is possible that at a macro level, higher life expectancy spurs higher incomes, but also richer countries could present higher life expectancies because of stronger health care systems. Life expectancy proved to be positively significant in the following regression table under the balanced equation specification in column (5). Initial income was significant in all column specifications of the main table in annex 3, but negatively affected growth. This could be explained by the steady state theory from the growth literature as exemplified by the Inada conditions in equations (2) and (3).

Based upon my data analysis before running regressions, it was decided that the debt variable should be omitted given the low number of observations. This decision should not affect the model because the correlation matrix in annex 2 does not show a very strong relationship between debt and the Polity IV variable. Including this variable would greatly decrease overall observations and I had already lost plenty of observations because I decided to work with five-year averages for the 1960-2011 time period.

Inflation has an interesting affect on growth, because the impact depends on the varying degrees of inflation rates as suggested by Barro (2013). Inflation rates close to 10% can hinder growth, although the impact of high inflation is most noticeable for long term decreases in standards of living. Inflation was insignificant in empirical analyses presented in this paper

***Balanced Panel Data Set (No Fixed Effects)

	(1) Rate	(2) Rate	(3) Rate	(4) Rate	(5) Rate	(6) Rate
POLITY2	0.024 (0.015)	0.040* (0.017)	0.037* (0.016)	0.011 (0.016)	-0.001 (0.017)	0.011 (0.017)
year	0.015* (0.007)	0.014 (0.007)	0.020** (0.007)	0.015* (0.007)	0.008 (0.008)	0.011 (0.008)
II		-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	0.000*** (0.000)
GCF			0.077*** (0.022)	0.073** (0.022)	0.061* (0.026)	0.056* (0.028)
POP				-0.406** (0.152)	-0.338* (0.153)	-0.301 (0.154)
LE					0.039* (0.018)	0.034 (0.018)
INF						-0.000 (0.000)
OPEN						0.003 (0.003)
_cons	-28.15 (14.74)	-25.35 (14.57)	-39.23** (13.83)	-28.12 (14.76)	-17.83 (15.75)	-21.95 (17.07)
N	1258	1204	1133	1133	1133	1110
R-sq	0.006	0.011	0.056	0.077	0.084	0.084

Standard errors in parentheses

* p<0.05,**p<0.01,***p<0.001

b) Robustness Checks

Various robustness checks were included in the empirical work of this paper. All estimations were done using 5-year averages with lagged explanatory variables. The following table includes country fixed effects, while the preceding table presents a robustness check by estimating a balanced panel data model that drops country observations for time periods 1960-2011 where data is lacking. The ensuing table essentially replicates the main results table, but adds on the robustness checks by filtering data and excluding growth rates below -15% and those that exceed 15%. The Polity IV variable shows positive significance again at the 1% level, and aids in verifying the validity of my regression analysis because this specification presents a cleaner dataset with observations for all countries throughout the time period of study.

It is important to note the data filter used for outliers dropped a string of countries with atypical growth rates in the 1990s. These countries include Serbia, Bosnia & Herzegovina, Yugoslavia, and eastern European countries that experienced immense reversals of fortune after the collapse of the Berlin Wall. The split from the Soviet Union represented many years of economic hardships and internal struggles that noticeably present unreasonable yearly growth changes around the 20% level. The evidence is shown in the table below for all six regression specifications.

***Regressions with Country Fixed Effects and Outliers Filter

	(1) Rate	(2) Rate	(3) Rate	(4) Rate	(5) Rate	(6) Rate
POLITY2	0.102*** (0.022)	0.107*** (0.021)	0.113*** (0.022)	0.106*** (0.023)	0.086*** (0.024)	0.099*** (0.023)
II		-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	0.000*** (0.000)
GCF			-0.058*** (0.015)	-0.054*** (0.014)	-0.065*** (0.016)	0.064*** (0.016)
POP				-0.274 (0.173)	-0.234 (0.184)	-0.216 (0.191)
LE					0.044* (0.021)	0.030 (0.021)
INF						-0.001 (0.000)
OPEN						0.003 (0.005)
_cons	1.787*** (0.194)	0.869*** (0.017)	6.153*** (0.465)	2.578*** (0.409)	-0.129 (1.323)	1.540 (1.478)
N	1247	1195	1128	1128	1128	1106
R-sq	0.304	0.342	0.368	0.372	0.376	0.373

Standard errors in parentheses

* p<0.05,**p<0.01,***p<0.001

X. Conclusion and Recommendations

New institutional economics rose to prominence during the 1990s largely due to the seminal works of Douglass North regarding property rights and their impact on growth. Moreover, scholars such as Daron Acemoglu, Dani Rodrik, James Robinson, Robert Barro, and others have aided new institutional economics in complementing traditional economic theories regarding growth. Institutions are characterized by historical antecedents, political

situations, and by incentives interacting among individuals, nations, and governments. The role of institutions in economic growth was analyzed historically as well as empirically Acemoglu *et al* (2001), who introduced new variables to the classical growth regressions based largely upon the long heralded Solow-Swan model. I specified a growth regression based on the empirical findings of Miresteans and Tsangarides (2009) and decided to introduce a variable that would be a *proxy* for institutions.

I modeled with the Polity IV variable that depicts the degree of democracy or autocracy for most countries. This variable was found to be positively significant at the 1% confidence level for growth under all specifications in every table, after controlling for country heterogeneity (via a dummy variable), and growth outliers present in the dataset. The regressions also confirmed statistical significance for gross capital formation (highest significance level), initial income (highest significance level), population growth, and life expectancy. These findings are generally parallel to economic theory where capital accumulation (or factor accumulation), increases in the Solow-Swan model, life expectancy positively affects growth, and population growth is ambiguous depending on the relationship between population size and GDP.

Institutions can be identified by many variables including Polity IV, but also by property rights, constitutions, elections, and many others. We chose this variable due to data availability for the time series and also because of recommendations in the literature. Further studies could include other variables for institutions for perhaps a shorter time period. Reverse causality and multicollinearity are prevalent problems in the growth literature and the paper accounted for this issue to some extent by using lagged explanatory variables. More in depth statistical work needs to be done to improve empirical work in growth related fields. Also, I believe country heterogeneity should definitely be taken into account because we made a strong case for how historical causes affect eventual institutional outcomes.¹⁰ These robustness tests were very important in verifying statistical significance for institutions, which is ultimately the main focus of this paper. I tested a generic model for all countries, but further papers could concentrate on comparing and

¹⁰ I control for this by using fixed effects.

contrasting defined geographies. For instance, one could empirically focus on the institutional affect on growth between North America and Latin America.

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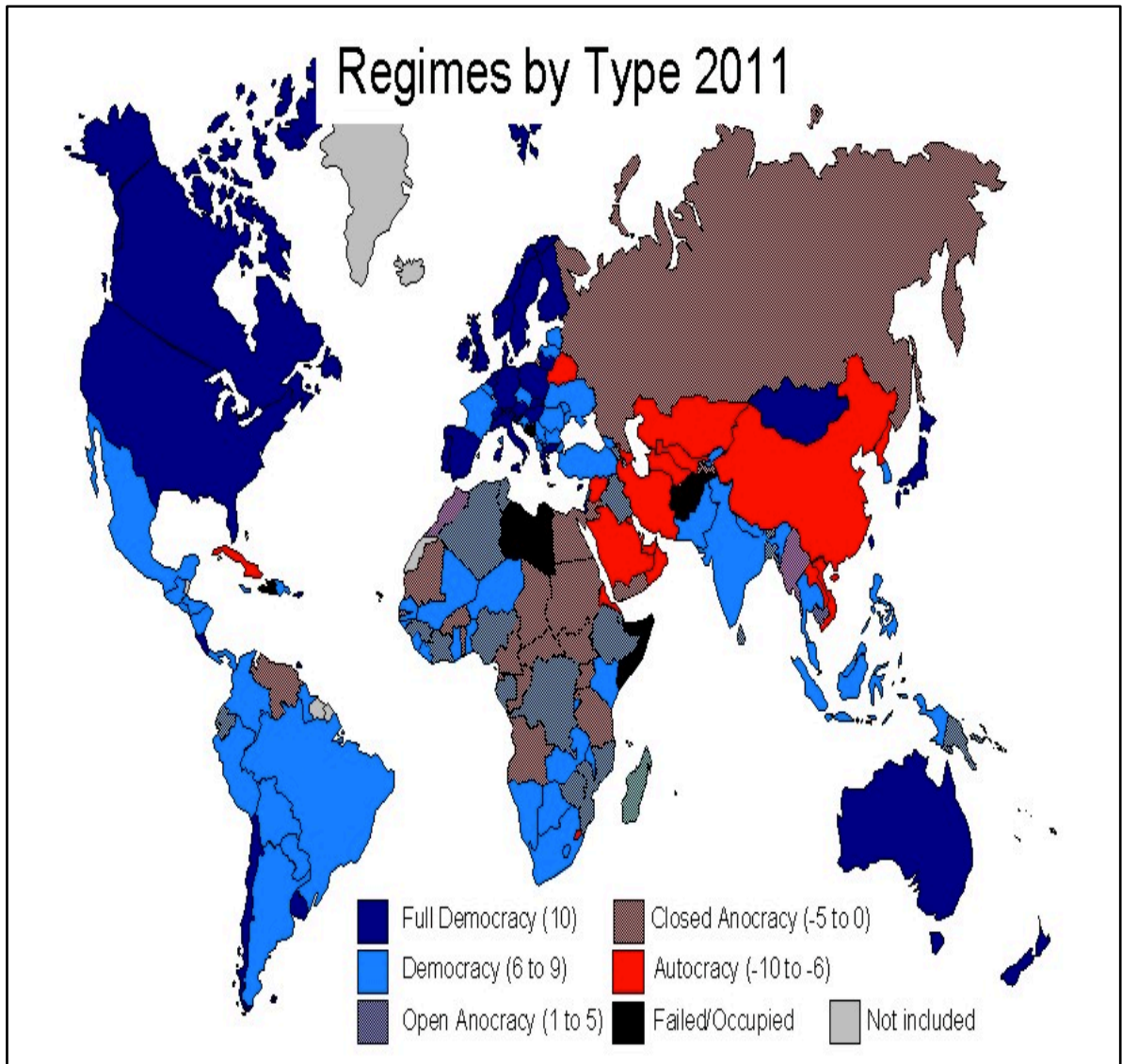
XII. Appendix

Annex 1

Online Data Sources and Descriptions

- <http://data.worldbank.org/>
- https://pwt.sas.upenn.edu/php_site/pwt71/pwt71_form_test.php
- <http://www.systemicpeace.org/polity/polity4.htm>
- <http://www.systemicpeace.org/inscr/inscr.htm>

Variables	Source	Brief Description
GROWTH RATE	The World Bank	Annual percentage growth rate of GDP per capita based on constant local currency.
GDP PER CAPITA	The World Bank	Gross Domestic Product divided by a country's population, a good measure of equality and welfare.
GROSS CAPITAL FORMATION	The World Bank	It is used as a proxy for investment following the Solow-Swan growth model. Includes fixed assets of an economy+changes in inventory.
POPULATION GROWTH	The World Bank	The exponential growth rate of a country's population, calculated as a yearly variation.
INFLATION	The World Bank	Annual growth rate of GDP implicit deflator that shows the rate of price changes in the aggregate economy.
DEBT	The World Bank	It is composed of government fixed-term contractual obligations to third parties.
LIFE EXPECTANCY	The World Bank	The number of years a newborn infant would live if mortality rates remained unchanged throughout the person's lifetime.
OPENNESS	Penn World Table 7.1	Openness to trade at 2005 constant prices.
POLITY2 (POLITY IV INDEX)	Polity IV Index	A variable that measures varying levels of political freedom. Interval includes -10 to 10 (-10 most autocratic, 10 mostly democratic)

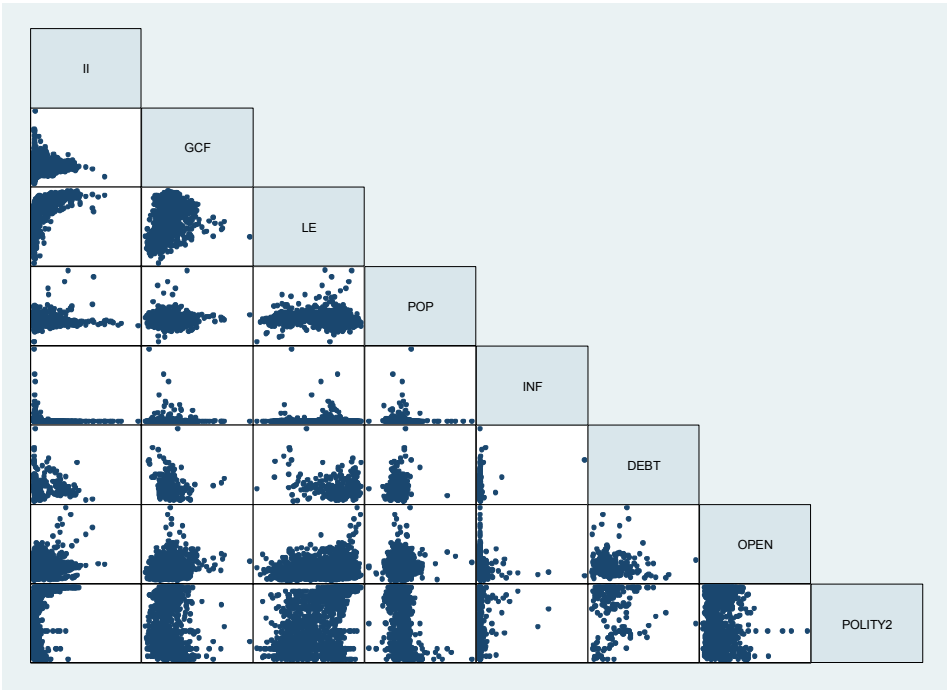


Source: Polity IV Index

Annex 2 Descriptive Statistics and Data Analysis

Variable	Obs.	Mean	Std. Dev.	Min	Max
year	11128.000	1985.500	15.009	1960.000	2011.000
RATE	1744.000	2.097	4.100	-42.809	33.136
II	1610.000	6444.549	10474.780	77.662	95885.270
GCF	1396.000	22.584	8.242	3.575	86.794
LE	1945.000	62.666	11.539	28.871	82.498
POP	2114.000	1.896	1.613	-4.645	16.245
INF	1568.000	37.787	269.817	-17.781	6962.832
DEBT	261.000	56.277	39.407	1.454	283.745
OPEN	1607.000	70.730	45.839	1.868	420.850
POLITY2	1390.000	0.534	7.319	-10.000	10.000

Correlation Matrix (Multicollinearity Check)



Annex 3

***All Empirical Work Done in Stata 10.1

**Do-File for all Estimations

***Regressions

**Rename variables

***5 Year Average with Lags

*Data Analysis

summarize

graph matrix (xi)..., half maxis(ylabel(none) xlabel(none))

reg RATE II GCF POP LE INF OPEN POLITY2, robust

eststo m1

estout m1, cells(b(star fmt(3)) se(par fmt(2)))

**Multicollinearity Test

**after regression

estat vif

*Fixed Effects

tabulate country, gen(x)

tabulate year, gen(z)

reg RATE II GCF POP LE INF OPEN POLITY x* z*

reg RATE II GCF POP LE INF OPEN POLITY2 x* z*, robust

**with filter

reg RATE II GCF POP LE INF OPEN POLITY2 x*if RATE>-15 & RATE<15

**with time trends

reg RATEPOLITY2 II GCF POP LE INF OPEN x* year if RATE>-15 & RATE<15

***Creating Output Tables

eststo: reg RATE POLITY2, robust

esttab raw

***More Advanced

reg RATE POLITY2, robust

eststo model1

reg RATE POLITY2 II, robust

eststo model2

reg RATE POLITY2 II GCF, robust

eststo model3

xi: reg POLITY2 II GCF POP LE OPEN INF, robust

esttab, r2 ar2 se scalar(rmse) no gaps

esttab se r2 se(3) b(3) replace drop(x* _llanX*)