

DOKUZ EYLÜL UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES
DEPARTMENT OF ECONOMICS
ECONOMICS PROGRAM
DOCTORAL THESIS
Doctor of Philosophy (PhD)

**ECONOMIC GROWTH, INSTITUTIONS AND INCOME
INEQUALITY**

Erol Türker TÜMER

Supervisor
Prof.Dr. Yeşim ÜÇDOĞRUK GÜREL

İZMİR - 2021



DECLARATION

I hereby declare that this doctoral thesis titled as “Economic Growth, Institutions and Income Inequality” has been written by myself in accordance with the academic rules and ethical conduct. I also declare that all materials benefited in this thesis consist of the mentioned resources in the reference list. I verify all these with my honour.

Date

.../.../.....

Erol Türker TÜMER

ABSTRACT
Doctoral Thesis
Doctor of Philosophy (PhD)
Economic Growth, Institutions and Income Inequality
Erol Türker TÜMER

Dokuz Eylül University
Graduate School of Social Sciences
Department of Economics
Economics Program

Economists have long recognized that institutions are among the main determinants of economic growth and prosperity. However, the question of how institutional structures affect economic outcomes is still a matter of debate, as so far, neither theoretical nor empirical studies have elaborately revealed the possible mechanisms of interaction between institutions and economic variables. This thesis attempts to fill this gap in the literature by developing two theoretical models that incorporate institutions into the growth analysis. The first model proposed in the study reconfigures the original Solow growth model by establishing a direct link between institutions and capital formation. Relaxing the assumptions of the savings-investment equality and the frictionless capital markets, this model presumes that institutions of property rights along with other country-specific factors affect an economy's investment dynamics. The results derived from the model indicate that developing high-quality institutions that lower transaction costs and uncertainty in the capital market will foster capital accumulation, output production, and economic growth. Examining the causes of institutional development concurrently with its effects on economic progress, the second model reveals that government policies regarding institutions have notable impacts on income, capital formation, and economic growth. The results pointedly suggest that economies in which

governments invest more in institutions would have a better institutional framework, more capital stock, and higher income levels and growth rates.

The examination of cross-country data over various periods has revealed some evidence consistent with the above implications. Both the cross-sectional and panel data analyses demonstrate that institutional quality is correlated positively with income levels, growth rates, and capital formation. As hypothesized, it is found that institutions that secure property rights, maintain the rule of law, and support political freedom are conducive to economic growth and development. Moreover, the evidence indicates these results are robust to variations in control variables, the model specification, the method of analysis, and the definition of institutions. The empirical analyses also show that besides institutions, the investment/savings rate seems to be one of the fundamental determinants of long-run economic performance. The results indicate that countries devoting a larger share of their resources to capital expansion tend to record higher income levels and growth rates. These findings, considered together, reveal that institutional development and capital accumulation are two main pillars of economic progress over the long term. More importantly, they point out that a significant portion of observed differences in growth and prosperity appears to stem from cross-country variations in institutional quality and capital formation. Concordantly, the thesis at hand suggests that to prosper and develop, countries, especially those lagging behind in income ranking, should primarily focus on developing policies and strategies regarding how to improve the institutional framework and foster capital expansion.

Keywords: Economic Growth, Institutions, Economic Development, Growth Models, Convergence

ÖZET

Doktora Tezi

Ekonomik Büyüme, Kurumlar ve Gelir Eşitsizliği

Erol Türker TÜMER

Dokuz Eylül Üniversitesi

Sosyal Bilimler Enstitüsü

İngilizce İktisat Anabilim Dalı

İngilizce İktisat Programı

Ekonomistler, kurumların, ekonomik büyüme ve refahın temel belirleyicileri arasında olduğunu uzun zamandır kabul etmektedir. Bununla birlikte, kurumsal yapıların ekonomik sonuçları nasıl etkilediği sorusu hala bir tartışma konusudur, çünkü şimdiye kadar ne teorik ne de ampirik çalışmalar kurumlar ve ekonomik değişkenler arasındaki olası etkileşim mekanizmalarını ayrıntılı bir şekilde ortaya koymamıştır. Bu tez, kurumları büyüme analizine dahil eden iki teorik model geliştirerek literatürdeki bu boşluğu doldurmaya çalışmaktadır. Çalışmada önerilen ilk model, kurumlar ve sermaye oluşumu arasında doğrudan bir bağlantı kurarak orijinal Solow büyüme modelini yeniden yapılandırmaktadır. Tasarruf-yatırım eşitliği ve sürtünmesiz sermaye piyasaları varsayımlarını gevşeten bu model, mülkiyet hakları kurumlarının diğer ülkeye özgü faktörlerle birlikte bir ekonominin yatırım dinamiklerini etkilediğini varsaymaktadır. Modelden elde edilen sonuçlar, sermaye piyasasında işlem maliyetlerini düşüren yüksek kaliteli kurumlar geliştirmenin sermaye birikimini, çıktı üretimini ve ekonomik büyümeyi teşvik edeceğini göstermektedir. Kurumsal gelişmenin nedenlerini ekonomik ilerleme üzerindeki etkileriyle eş zamanlı olarak inceleyen ikinci model, kurumlara ilişkin devlet politikalarının gelir, sermaye oluşumu ve ekonomik büyüme üzerinde önemli etkileri olduğunu ortaya koymaktadır. Sonuçlar, açık bir şekilde, hükümetlerin kurumlara daha fazla yatırım yaptığı ekonomilerin daha iyi bir kurumsal

çerçeveye, daha fazla sermaye stokuna ve daha yüksek gelir seviyelerine ve büyüme oranlarına sahip olacağını göstermektedir.

Çeşitli dönemlere ait ülkeler arası verilerin incelenmesi, yukarıdaki çıkarımlarla uyumlu bazı bulgular ortaya koymuştur. Hem kesitsel analizler hem de panel veri analizleri, kurumsal kalitenin gelir seviyeleri, büyüme oranları ve sermaye oluşumu ile pozitif yönde ilişkili olduğunu göstermektedir. Varsayıldığı gibi, mülkiyet haklarını güvence altına alan, hukukun üstünlüğünü sürdüren ve siyasi özgürlüğü destekleyen kurumların ekonomik büyüme ve kalkınmaya yardımcı olduğu bulunmuştur. Buna ek olarak kanıtlar, bu sonuçların kontrol değişkenlerindeki, model yapısındaki, analiz yöntemindeki ve kurum tanımındaki değişikliklere karşı da sağlam olduğunu göstermektedir. Ayrıca, ampirik analizler, kurumların yanı sıra yatırım/tasarruf oranının da uzun vadeli ekonomik performansın temel belirleyicilerinden biri olduğunu göstermektedir. Sonuçlar, kaynaklarının daha büyük bir bölümünü sermaye genişlemesine ayıran ülkelerin daha yüksek gelir seviyeleri ve büyüme oranları kaydetme eğiliminde olduğunu belirtmektedir. Bu bulgular, birlikte değerlendirildiğinde, kurumsal gelişme ve sermaye birikiminin uzun vadede ekonomik ilerlemenin iki temel direği olduğunu ortaya koymaktadır. Daha da önemlisi, büyüme ve refahta gözlemlenen ülkeler arası farklılıkların önemli bir kısmının kurumsal kalite ve sermaye oluşumundaki farklılıklarından kaynaklandığına işaret etmektedirler. Buna paralel olarak, eldeki tez, zenginleşmek ve gelişmek için, ülkelerin, özellikle de gelir sıralamasında geride kalanların, öncelikle kurumsal çerçeveyi nasıl iyileştireceklerine ve sermaye genişlemesini nasıl teşvik edeceklerine ilişkin politika ve stratejiler geliştirmeye odaklanmaları gerektiğini öne sürmektedir.

Anahtar Kelimeler: Ekonomik Büyüme, Kurumlar, Ekonomik Kalkınma, Büyüme Modelleri, Yakınsama

ECONOMIC GROWTH, INSTITUTIONS AND INCOME INEQUALITY

TABLE OF CONTENTS

APPROVAL PAGE	ii
DECLARATION	iii
ABSTRACT	iv
ÖZET	vi
TABLE OF CONTENTS	viii
ABBREVIATIONS	x
LIST OF TABLES	xi
LIST OF FIGURES	xii
LIST OF APPENDICES	xiii

INTRODUCTION	1
--------------	---

CHAPTER ONE

THE WORLD INCOME DISTRIBUTION AND INSTITUTIONS

1.1. INTRODUCTION	10
1.2. STYLIZED FACTS ABOUT THE WORLD INCOME DISTRIBUTION	14
1.3. LITERATURE SURVEY	31
1.4. CONCLUDING REMARKS	57

CHAPTER TWO

INSTITUTIONS AND ECONOMIC PERFORMANCE: THE THEORETICAL FRAMEWORK

2.1. INTRODUCTION	59
2.2. MODEL 1: INSTITUTIONS IN A SIMPLE MODEL OF ECONOMIC GROWTH	66
2.2.1. Theoretical Background	66

2.2.2. The Model	70
2.3. MODEL 2: THE GOVERNMENT, INSTITUTIONAL DEVELOPMENT AND ECONOMIC GROWTH	81
2.3.1. Theoretical Background	81
2.3.2. The Model	86
2.4. CONCLUDING REMARKS	99

CHAPTER THREE THE EMPIRICAL ANALYSIS

3.1. INTRODUCTION	102
3.2. THE DESCRIPTIVE ANALYSIS	107
3.3. REGRESSION RESULTS	121
3.3.1. Cross-Sectional Regressions	121
3.3.2. Panel Data Regressions	140
3.4. CONCLUDING REMARKS	148
CONCLUSION	151
REFERENCES	156
APPENDICES	

ABBREVIATIONS

BC	before Christ
CEPII	The Centre d'Études Prospectives et d'Informations Internationales
CL	Civil Liberties
CSL	Common Spoken Language
CV	Coefficient of Variation
D.R. Congo	The Democratic Republic of Congo
e.g.	exempli gratia (Latin for “for example”)
et al.	et alia (Latin for “and others”)
etc.	et cetera (Latin for “so forth”)
FE	Fixed Effects
GDP	Gross Domestic Product
HIEF	The Historical Index of Ethnic Fractionalization
i.e.	id est (Latin for “that is”)
LSPR	Legal System and Property Rights
LSDV	Least Squares Dummy Variable
OECD	The Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares
POLFREE	Political Freedom
PR	Political Rights
PPP	Purchasing Power Parity
PWT	Penn World Table
RE	Random Effects
RGDP^e	Expenditure-side real GDP at chained PPPs
RGDP^{NA}	Real GDP at constant national prices
SETM	Settler Mortality Rates
SGIN	The Size of Government Index
TAXIN	The Top Marginal Tax Rate Index
2SLS	Two-Stage Least Squares
UNSD	The United Nations Statistics Division
U.S.	The United States

LIST OF TABLES

Table 1: Threshold Values of Income Groups	p. 25
Table 2: Transition Matrix (in percentages), 99 Countries, 1960-2014	p. 26
Table 3: Descriptive Statistics of Regression Variables	p. 128
Table 4: GDP Per Capita and Legal System and Property Rights Index: OLS and 2SLS Estimates	p. 131
Table 5: GDP Per Capita and Political Freedom Index: OLS and 2SLS Estimates	p. 132
Table 6: Economic Growth and Legal System and Property Rights Index: OLS and 2SLS Estimates	p. 138
Table 7: Economic Growth and Political Freedom Index: OLS and 2SLS Estimates	p. 139
Table 8: Economic Performance and Institutions: Panel Regressions of 5-year span data, Fixed Effects (FE) Estimates, 2000-2014	p. 145

LIST OF FIGURES

Figure 1: Lorenz Curve of the World, 182 Countries, 2014	p. 17
Figure 2: Dispersion of Real GDP Per Capita, 99 Countries, 1960-2014	p. 19
Figure 3: Histogram for Growth Rate of Real GDP Per Capita, 99 Countries, 1960-2014	p. 21
Figure 4: Scatterplot of Economic Development and Legal System and Property Rights Index, 1960-2014	p. 111
Figure 5: Scatterplot of Economic Development and Political Freedom Index, 1960-2014	p. 112
Figure 6: Scatterplot of Economic Growth and Legal System and Property Rights Index, 1960-2014	p. 114
Figure 7: Scatterplot of Economic Growth and Political Freedom Index, 1960-2014	p. 115
Figure 8: Scatterplot of Share of Gross Capital Formation and Legal System and Property Rights Index, 1960-2014	p. 117
Figure 9: Scatterplot of Human Capital and Legal System and Property Rights Index, 1960-2014	p. 118
Figure 10: Scatterplot of Share of Gross Capital Formation and Political Freedom Index, 1960-2014	p. 119
Figure 11: Scatterplot of Human Capital and Political Freedom Index, 1960-2014	p. 120

LIST OF APPENDICES

Appendix Table 1: The List of Countries by Income Groups, 1960	app. p. 1
Appendix Table 2: The List of Countries by Income Groups, 2014	app. p. 2
Appendix Table 3: First Stage Results of 2SLS Estimates in Tables 4-5	app. p. 3
Appendix Table 4: First Stage Results of 2SLS Estimates in Tables 6-7	app. p. 4



INTRODUCTION

The world has never been a place of equality. During the history of civilization, economic conditions have continuously differed across societies and countries. While some countries have managed to be prosperous over long periods of time, others have hardly enjoyed the fruits of economic well-being. In particular, those differences in living standards have become more pronounced over the last two centuries with the structural changes brought about by the industrial revolution (Acemoglu et al., 2002). Within this period, global inequality has ascended dramatically and reached levels never seen (or reported) before (Bourguignon and Morrisson, 2002; Pritchett, 1997).

Considering the significant implications of these developments for social, economic, and political issues, it is not surprising that the enigma of why countries have different living standards has always been among the most highlighted topics in the field of economics. Up until today, numerous studies have attempted to examine and reveal the causes of cross-country variations in economic growth and prosperity. As a result, a series of hypotheses based on various factors ranging from geographical endowments and cultural features to capital formation and technology has been developed so far to sort out what essentially drives the observed contrasts in economic conditions (Diamond, 2004; Gallup et al., 1998; Landes, 2017; Mankiw et al., 1992; Solow, 1956; Weber, 2005).

On the eve of the millennium, the institutions hypothesis, which ascribes variations in economic performance principally to institutional differences, has begun to appear as one of the prominent views in the comparative development literature. Many studies, including North (1990) and Acemoglu and Robinson (2013), have stated that institutions, as the set of rules and constraints defining the forms of social, economic, and political interactions, are the main elements of the process of economic development and growth. The basic assumption of this view is that having inclusive institutions, such as well-protected property rights, effective legal systems, and democratic regimes, would foster innovative and productive activities within national borders (Acemoglu and Robinson, 2013: 73-83). Thus, it is hypothesized that countries developing such institutions would grow faster than

others and achieve higher living standards in the long run. Accordingly, this approach posits that, rather than other factors cited as possible candidates, it is institutions in the first place that account for variations in income levels among world economies.

Following these arguments, an enormous literature that examines the particular role of institutional arrangements in determining differences in economic prosperity and growth has emerged lately. Concordantly, several studies within this strand of the literature have pointed to the positive correlation between institutional quality and economic progress, which supports the idea that institutional structures indeed matter for the long-term economic performance (Acemoglu et al., 2001; Acemoglu et al., 2002; Acemoglu et al., 2014; Assane and Grammy, 2003; Dias and Tebaldi, 2012; Easterly and Levine, 2003; Knack and Keefer, 1995; Mauro, 1995; Rodrik et al., 2004; Scully, 1988). More than that, some studies examining the relative contributions of institutional, geographic, and cultural factors to economic development reported that institutional differences are the leading cause of prevalent differences in income levels among countries (Acemoglu et al., 2001; Acemoglu et al., 2002; Easterly and Levine, 2003; Rodrik et al., 2004).

Despite these studies that help recognize the importance of institutions as a determinant of economic development, there is yet no consensus on how institutional factors affect economic performance. Indeed, the existing literature seems to be far from providing persuasive explanations for several aspects of the relationship between institutional and economic development. Among these, the lack of theoretical analysis establishing the links between institutional and economic variables comes first in the ranking. A thorough review of the literature indicates that in attempting to evaluate the impact of institutions on economic outcomes, most studies have resorted solely to empirical analysis. Thus, they have generally neglected the theoretical analysis, particularly concerning the mechanisms and processes through which institutional structures affect economic outcomes. Besides this, the survey of existing literature suggests that even some of the previous papers have proposed formal models that account for institutional factors, the implications of these models mostly remain scanty in the sense that they either reduce institutions to a particular policy variable (e.g., tax rates) or regard them as fixed factors without

noticing their ever-changing nature in time (Barro, 1990; Barro and Sala-i-Martin, 2004; Becker, 1983; Emerson, 2006; Meltzer and Richard, 1981; Przeworski and Wallerstein, 1988; Romer, 1990).

The question of how institutional factors influence economic progress has not been covered sufficiently yet in the theoretical growth literature as well. Conventionally, studies on growth theory have preferred to follow the neoclassical approach, which treats institutions as given factors that have no distinctive role in the economic growth and development process (Mankiw et al., 1992; Solow, 1956). But, given the strong empirical support for the close relationship between economic prosperity and institutional framework, relying on this approach is clearly inappropriate to formulate a grounded theory of growth. As one can imagine, disregarding institutions in the analysis might result in overlooking the effect of a fundamental element on critical variables and relations, and thus, can provide a flawed explanation for the process of economic growth. On that account, unlike the neoclassical approach followed by some of the early studies, models of growth and development need to be designed so as to embrace the impact of institutions and institutional changes to reveal mechanisms of interaction between institutions and economic variables. As examples of theoretical models of this kind are not prevalent, the exact way of how institutions affect growth and development remains still an issue unsolved in the literature on growth economics.

In addition to these theoretical problems, there are several discomforts regarding empirical strategies commonly followed in the literature. For instance, parallel to the neglect of theoretical framework, it appears that most studies on the subject have relied on relatively arbitrary practices while designing their empirical analysis. Although a certain level of arbitrariness is acceptable, lacking the guidance of a well-developed theoretical model can lead to several estimation problems that may lower the reliability of findings. The model specification error and the omitted variable bias are two of the many problems that might blur empirical results based on regression analysis (Gujarati and Porter, 2009; Leightner and Inoue, 2007). Besides this, the endogeneity problem stemming from the intimate relations between institutions and income levels can create inconsistencies in parameter estimates when

it is neglected or handled poorly (Acemoglu et al., 2001; Acemoglu et al., 2002; Gujarati and Porter, 2009; Hall and Jones, 1999; Mauro, 1995; Rodrik et al., 2004).

Although a theoretical framework does not necessarily provide particular solutions to each of these problems, it can help deal with them indirectly by either revealing the exact linkages between key variables of interest or clearly expressing the assumptions regarding which variables to treat endogenous or exogenous. Thus, these arguments indicate that even for studies that aim to focus solely on the empirical dimension of the relationship between institutions and economic outcomes, following a theoretical model is essential to avoid most of the issues above. When considered in this context, however, it is found that many studies in the literature are subject to one or several of these problems, as they generally do not develop their estimation strategies based on a formal model (see, for example, Acemoglu et al., 2001; Acemoglu et al., 2002; Rodrik and Wacziarg, 2005; Rodrik et al., 2004; Easterly and Levine, 2003; Scully, 1988). Therefore, it appears that the existing literature is open to improvement not only in the theoretical dimension but also in the empirical dimension in that a systematic and reliable analysis of the relationship is needed to understand the nexus between institutional factors and economic development.

The discussions above, taking together, imply that further research is warranted to gain a better understanding of the role of institutions in the process of economic growth and development. Motivated by the arguments above, this thesis reexamines the relationship between institutions and economic prosperity using both theoretical and empirical analyses jointly. The main objective here is to develop theoretical models that relate economic growth and prosperity to institutional structures and perform empirical analysis based on these models. In accordance with this purpose, the thesis offers two novel models showing how institutions and institutional changes can be integrated into the growth analysis and then tests these models' implications using cross-country analyses.

Given these efforts, this thesis intends to contribute to the existing literature in two dimensions. First, by developing formal models that reveal mechanisms of interaction between institutional and economic variables, it aims to make a contribution to the literature on modeling, particularly regarding how to treat

institutions in a neoclassical framework. Second, formulating an empirical strategy relying on these theoretical models, the study aspires to overcome some of the widespread issues that previous studies have encountered and thus provide suggestive evidence adding to the current status of knowledge on the relationship between institutions, economic growth, and development.

The thesis at hand consists of three main chapters that deal in sequence with different aspects of the subject. In chapter one, the study seeks to examine differences in economic performance across countries together with the possible reasons making up these differences. Concordantly, the chapter begins with analyses documenting the stylized facts about the form and evolution of world income distribution and then turns its attention to reviewing competing theories that attempt to shed light on the underpinnings of prevalent differences in economic growth and development. In a nutshell, the results based on these efforts reveal two notable facts: (1) income levels and growth rates varies considerably across countries; and (2) these variations can only be explained by the institutions hypothesis that provides a comprehensive framework help understand even differences among countries having similar cultural and geographical features. Given these results, the chapter thus concludes that if the objective is to discover and analyze the origins of prosperity, it is more appropriate to develop arguments and theories based on the institutions hypothesis rather than the alternatives.

Chapter two proceeds in line with these suggestions and introduces the theoretical analysis that incorporates institutional factors. Essentially, the analysis presented in this chapter comprises two alternative growth models, which hinge on different assumptions about the nature of institutional structures. Among these two, the first model attempts to reformulate the original Solow growth model by focusing mainly on the link between capital formation and institutional arrangements. Built on the assumption that better institutions will lower transaction costs embedded in the capital market, this model shows that institutional structures, even treated as exogenous, have notable impacts on steady-state conditions and convergence dynamics. The results suggest that an economy surrounded by inclusive institutions would achieve higher capital and income per capita levels at steady-state. In addition to this, the analysis reveals that the quality of established institutions would affect

growth rates while an economy converges towards the long-run equilibrium. It is shown that a permanent increase in institutional quality, all other things equal, would lead to a higher growth rate during the convergence period. Accordingly, the results derived from this model underline the fact that institutional factors are among the main determinants of the long-run economic performance. Moreover, these results indicate that institutional differences can elucidate a significant portion of variations in income levels, capital formation, and growth rates across countries. Lastly, the model at hand shows that factors other than institutions, such as the savings ratio, population growth, the rate of technological progress, and social capital, also have a role in determining the level and growth rate of income per capita. Within this context, this model replicates the main implications of the Solow model and extends the scope of analysis by adding variables related to social capital to the theory of growth.

The second model developed in this thesis proposes a framework in which institutional development is treated as an endogenous process. Thus, different from the first one, this model of growth allows for examining the causes of institutional development besides its effects on economic outcomes. In this model, the critical assumption is that the government is the only agent responsible for developing and maintaining institutions. On the basis of this assumption, it is hypothesized that the institutional changes are driven fundamentally by the purposeful policies followed by national governments. The main implications of this model follow from this configuration. For instance, the analysis reveals that the equilibrium level of institutional quality is dependent on the relative weight given by the government to maintaining law and order. At steady-state, institutional development appears as an increasing function of the share of resources allocated from total state revenues. Assuming all other things equal, this means that economies in which governments invest more in institutions would have a better institutional framework than others. Thus, the model shows that, at least in theory, state policies can determine the quality of resultant institutions. In this respect, this model of growth suggests that the prevalent differences in institutional structures across countries can be explained, to some degree, by the contrasts in government spending.

The model also explores how intentional government policies and institutional arrangements affect the long-run economic performance. The income and convergence equations derived from the model show that institutional quality and the share of expenditures on institutions are among the main determinants of economic progress, together with capital formation, population growth, technology, and tax structure. According to the results, both the steady-state level of income and the growth rate of per capita in the transition period associate positively with institutional quality and spending on institutions. Thus, the model implies that in countries where the government gives particular importance to institutional reforms, the level and growth rate of income per capita would be higher, when other things are held constant. In this respect, this theory of growth suggests that the preferences regarding how to use state revenues will not affect only the path of institutional evolution but also the long-run development process. More importantly, pointing to the importance of institutions and institutional reforms, this framework indicates that if countries differ vastly in their policies and institutional structures, there will not be convergence but divergence among income levels. Therefore, the model at hand provides a partial explanation for why income gaps between countries might constantly widen rather than narrow. Additively, the model confirms the close association between institutional development and capital formation and thereby reinforces the results obtained in the first model.

Overall, the analyses introduced in the second chapter help reveal how institutional arrangements affect economic outcomes under different assumptions. Further, these analyses disclose the theoretical determinants of economic growth and development and thus assist in providing a solid basis for the empirical part of the analysis as a side benefit.

Chapter three presents the result of empirical analysis built on the theoretical models developed in the thesis. In order to examine the impacts of institutional factors and other key variables of interest on economic performance, the study employs various methods based on cross-country data. Generally speaking, the evidence from these analyses appears to confirm the hypotheses proposed by the formal models. For instance, it is found that countries having high-quality institutions in economic and political spheres tend to have higher income levels and

growth rates, as implied by the theoretical analysis. Moreover, the results show that, although improvements in both aspects of institutions correlate positively with economic performance, inclusive economic institutions seem to be more rewarding for economic progress than their political counterparts. The empirical estimates also indicate that these general patterns remain solid even after controlling for other country-specific factors and various estimation problems. Besides these, the results provided in this chapter suggest that other than institutions, factors such as capital formation, ethnic diversity, and tax structure can also affect economic growth and development. Estimations revealed that having higher saving rates, less fragmented societies, and lower tax rates result in better economic performance. Lastly, the analysis provides evidence consistent with the conditional convergence hypothesis suggesting that initial income levels can predict differentials in subsequent economic growth only if countries have similar characteristics. Since it is a well-known fact that economies differ vastly in terms of the institutional framework, capital structure, and tax system, this result implies that there is no “free lunch” for backward nations: being poor itself does not guarantee higher growth rates and rapid development. Accordingly, the evidence presented here suggests that the prevalent income gaps between the poor and rich can persist over long periods unless countries, particularly those economically disadvantageous ones, manage to develop policies and institutions similar to that of countries out front.

When evaluated together with the theoretical results, these findings show that institutions play a critical role in the process of development. In fact, the present analysis indicates that the wide variation in economic growth and prosperity over the last few decades can be attributed directly to institutional differences across countries. In this respect, the thesis at hand suggests, as a bottom line, that institutional reforms in the economic, legal, political environments should be given special attention when designing strategies to foster long-run welfare and thus end poverty across the globe.

The plan of the thesis is as follows. As stated above, chapter one documents the stylized facts about the world income distribution and reviews theories that have attempted to explain these facts. Following this, chapter two introduces the theoretical models developed in the thesis. Chapter three presents elaborately the

results of the empirical analysis based on these models. Lastly, the conclusion section summarizes the main points and discusses the policy implications derived from these results.



CHAPTER ONE

THE WORLD INCOME DISTRIBUTION AND INSTITUTIONS

1.1. INTRODUCTION

Throughout history, there have been notable differences in living standards among the regions of the world. While some people living in prosperous regions have enjoyed high-income levels, advanced health and educational services, and peaceful social environments, others in poor regions have suffered from famines, poor health conditions, insufficient education facilities, wars, and social disorder. In attempting to evaluate these differences, the first and foremost question that must come to someone's mind is: Why has it been so? To be more precise, why some countries or regions are more successful in providing an affluent life to their citizens compared to others? Are there any distinctive factors that contribute significantly to the economic performance of these countries? If any, which set of policies or action plans based on these factors should be implemented to close the development gaps across the world?

These are fundamental questions that have been constantly asked by scholars since the foundation of economics as a separate discipline. So far, numerous studies have strived for uncovering the key determinants of countries' economic success or failure. Among many others, differences in geographical factors such as location, climatic environment, endemic diseases, and natural resource endowments, or variations in social norms stemming from cultural or religious traditions have been pointed out frequently by previous works as possible explanations for huge discrepancies in the economic performance of countries (Barro and McCleary, 2003; Diamond, 2004; Gallup et al., 1998; Landes, 2017; Sachs, 2001; Sachs and Warner, 1995; Weber, 2005). In addition, a large body of growth and development literature focused on factors related to the productive capacity of nations such as saving and investment rates, human and physical capital, international trade, and technological knowledge to account for international differences in the level and pace of development (Domar, 1946; Easterlin, 1981; Frankel and Romer, 1999; Harrod, 1939; Landes, 1990; Lucas, 1988; Mankiw et al., 1992; Sachs and Warner, 1995;

Solow, 1956; Romer, 1990). As it is scrutinized in the third section, however, each of these factors comes up with their own problems in elucidating cross-country income differences. Empirical evidence documented in the literature is far from building a consensus on the relative importance of these factors in generating or sustaining welfare. For instance, it is a well-known fact that geographical variables such as location, climate, natural resource endowments, and diseases remain incapable to explain divergent development experiences of neighboring societies that are subject to similar conditions. The distinct economic performance of South Korea from its northern neighbor and the observed differences in living standards between East and West parts of Germany after World War II are two of the examples for which geographical factors cannot be evaluated as the main driver of contrasting economic performances (Acemoglu et al., 2001: 1369). Also, the actual income differences between Haiti and the Dominican Republic, which are sharing the same border on the Caribbean island of Hispaniola, make it hard to rely solely on geographical factors to understand comparative development differences in the world¹. Moreover, these time-invariant or long-lasting forces have a common deficiency in examining a country's or a region's varying economic performance through time. For example, Acemoglu et al. (2002: 1244-1279) documented the income reversal between relatively poor and rich regions over the last five hundred years. They showed that while the prosperous regions of the world about the year 1500 have shown little progress and became poor in time, the regions that were formerly poor have experienced a rapid development phase and became relatively rich today –a result that virtually rules out fixed geographical factors as one of the key determinants of economic progress.

In the same vein, some examples indicate that cultural or religious factors seem to be inadequate to shed light on different development patterns of countries with similar traditions or religious beliefs. The divergent settlement experiences of Vikings in the Faroe Islands, Iceland, Greenland, and Vinland during the Viking expansion can be regarded as one of the contradictory evidence of culture/religion hypothesis (Diamond, 2019: 234-274). In addition to this, Sokoloff and Engerman

¹ In 2014, Dominican Republic has a per capita income of \$12,511, which is approximately 8 times higher than that of Haiti (\$1,562). These numbers are the author's own calculations based on expenditure-side real GDP (RGDP^e) data estimates from Penn World Table (PWT) version 9.0.

(2000: 218-219) pointed out the significant disparities in economic performance across British colonies during and after the colonization era, which implies that national or cultural heritage plays at best a minor role in economic development. Lastly, theories based on differences in saving rates, investment rates, human and physical capital, and speed of technological progress can only be considered as a first step to understand welfare differences between societies; because, these explanations immediately give rise to the question of what are the underlying factors that lead to such differences across countries.

In light of the above discussions, economists have recently chewed over an alternative approach that seems to overcome many of the shortcomings of existing theories. Over the last few decades, the institutionalist view has been revived by a number of scholars as an interpretation of contrasting economic performances of countries (Acemoglu, et al., 2001; Acemoglu, et al., 2002; Easterly and Levine, 2003; North, 1990; Rodrik et al., 2004; Scully, 1988). According to this approach, institutional differences in economic and political spheres are the fundamental causes of cross-country variations in the level of economic development. Briefly, this contention relies on the assumption that institutional structures are influential over economic agents' actions (Boland, 1979: 959-961). Institutions, which are defined as the rules of games in political, economic, and social areas, underlie the incentive mechanisms, and thereby, shape the behaviors and motivations of individuals (Leblang, 1996: 7-9; North, 1991: 97-102). Therefore, at a micro-level, they play a significant role in defining individuals' economic decisions regarding how much to produce or work, or how much to invest, or how much time to devote to acquire new skills or create something new. At a macro-level, these individual decisions collectively determine a nation's overall success in allocating resources, increasing productivity, creating an innovative capacity, and stimulating economic activities. In this regard, institution hypothesis claims that countries that have developed a cluster of "inclusive" institutions such as a democratic political sphere, well-protected property rights, and efficient legal systems –which encourages a broad section of society to engage in economic and political activities– are more likely to grow faster than others and achieve better living standards in the long run (Acemoglu, 2002: 1262-1264; Acemoglu and Robinson, 2013: 73-83; Leblang, 1996: 7-9).

Accordingly, the institutions view basically proposes that the established differences in institutional quality are the fundamental causes of divergent development patterns that societies have followed in time.

Taken together, the discussions above imply that there has not been any consensus among economists on the main drivers of the cross-country income differences. In particular, this brief review suggests that there are at least two main issues in the field of comparative development that still attract the attention of researchers: the structure of the global income distribution and the underlying factors that affect its evolution. In this chapter, the main motivation is to examine these topics in turn by following a two-stage strategy. In the first stage, the main focus is centered on documenting differences in the level and pace of economic development across countries to reveal stylized facts about the evolution of world income distribution. Results based on several measures of income distribution show that there have been huge differences in living standards across countries as well as regions. Moreover, the analysis reveals that these differences have tended to reproduce themselves over time: due to the low growth performance of many poor countries, global inequality has widened over the past fifty years. In the second stage, the study shifts its attention to the main determinants of these observed patterns of the global income distribution. A detailed review of the comparative development literature suggests that, compared to other alternatives, the institutional hypothesis provides a better theoretical framework to understand cross-country variations in economic performance. Besides this, it is shown that the empirical findings presented by earlier studies are usually in line with the idea that institutional factors are the main sources of cross-country differences in economic performance. Once the institutional factors are controlled for, the evidence does not seem to imply any systematic pattern between geographical or cultural factors and economic performance.

The remainder of the chapter is structured as follows. The next section presents evidence on the evolution of world income distribution and identifies some of the prominent patterns observed in the last few decades. Section three discusses the competing theories on comparative development in detail, and then, reviews empirical findings provided by existing literature to assess relative roles of

institutions and other factors in explaining contrasting development trajectories of countries. Finally, section four summarizes key findings and concludes the chapter.

1.2. STYLIZED FACTS ABOUT THE WORLD INCOME DISTRIBUTION

This section aims to reveal both static and dynamic patterns of cross-country income differences observed in the last fifty years. Accordingly, the majority of the section is devoted to comparing levels and growth rates of per capita income across countries. Several measures and statistical tools, which are respectively discussed in detail as the occasion arises, were employed to provide a comprehensive analysis of the evolution of international income differences in time. All of the relevant data for analyses were obtained from Penn World Table (PWT) version 9.0². The income per capita levels were computed in a conventional way, dividing a country's real gross domestic product (GDP) value by its population level in the corresponding year³, whereas the growth rate of a country was defined as the average annual change in real per capita GDP level over the period under discussion⁴. The results based on these two measures are presented in the following lines.

Before engaging in elaborate analyses, throwing a glance at actual data on income levels is useful to understand some of the prevailing features of the world income distribution. As stated in the introduction part, and mentioned by numerous studies in the literature, per capita income levels show substantial variations across countries. For instance, in 2014, Qatar, the richest country in the world, had a per capita GDP level of \$144,340, which was approximately 243 times higher than that of the poorest country, the Central African Republic, (\$594)⁵. This implies that, in

² The PWT 9.0 is an open-access dataset that publishes data on a broad range of economic variables for 182 countries over the period 1950-2014. For further information, see Feenstra et al. (2015).

³ Following Feenstra et al. (2015: 3154), this study used purchasing power parity (PPP) adjusted expenditure-side real GDP values in 2011 U.S. dollar prices (RGDP^e) to calculate per capita income levels of countries.

⁴ Formally, the formula used to obtain a country's average annual growth rate of income per capita between the years t and s is: $g = [\log(y_t) - \log(y_s)] / (t - s)$, where g is the growth rate, and y is the GDP per capita level of a country in the corresponding year. In this formula, per capita income levels were calculated using Real GDP at constant national prices (RGDP^{NA}), as this data series was regarded as more appropriate to estimate a country's per capita income growth rate over time (Feenstra et al., 2015: 3154).

⁵ All the estimations shown throughout this chapter are the author's own calculations based on PWT 9.0 dataset.

2014, the annual earnings of an average person living in the Central African Republic were almost equal to the 1.5-day income of an ordinary citizen of Qatar. Moreover, a simple exercise on growth rates can demonstrate that closing such a huge income gap is quite impossible even under some extraordinary assumptions. For example, if one assumes that Qatar's income will stagnate at its current level from now onwards and that the Central African Republic will grow at an astonishing annual rate of 10% in the following years, it will take approximately 55 years for the Central African Republic to catch up with the income level of Qatar, which is quite a long time for a person living in the Central African Republic considering the fact that life expectancy at birth is only around 50 years in this country⁶. Additionally, such notable differences in living standards are not only pertaining to those two countries; instead, the evidence shows that income inequality across nations is one of the dominant features of the world economy. For instance, among the richest twenty countries in 2014, the per capita GDP level was ranging from \$44,598 (Sweden) to \$144,340 (Qatar), suggesting that individuals living in these countries have enjoyed income levels at least three times higher than the world average (\$14,517)⁷. In contrast, the mean GDP per capita level of the twenty poorest nations was roughly equal to \$1,269⁸, and accounted for only 8.7% of the world average, implying that residents of these countries were living on income levels far worse than that of the average person living on the planet. Furthermore, in terms of population, the aforementioned cross-national differences are even more dramatic. Estimates show that the majority of the world population (i.e., 72.7% in 2014) has been living in countries that have income per capita levels lower than the world average⁹.

A more formal way to investigate such prevailing patterns in global income distribution is using a tool analogous to the Lorenz curve. Basically, the Lorenz

⁶ Data on life expectancy at birth for the Central African Republic is from World Bank, World Development Indicators (2020), see: https://data.worldbank.org/indicator/SP.DYN.LE00.IN?locations=CF&name_desc=false&view=chart (07.04.2020).

⁷ The world average income level was calculated by dividing the total real GDP level of 182 countries by the total population level in the world.

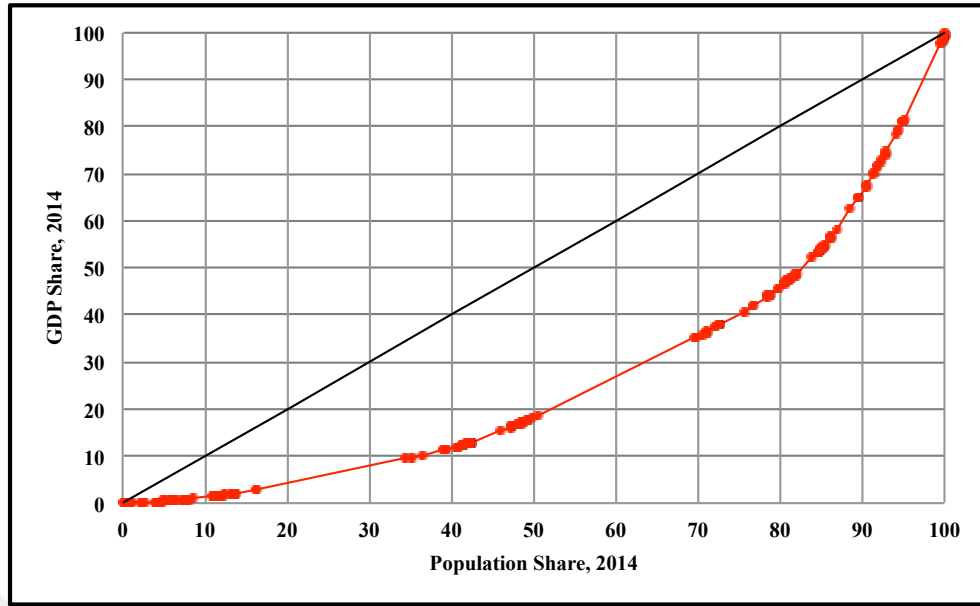
⁸ This number refers to the average of the per capita GDP levels of 20 countries, which does not consider population weights. When population levels are considered, the estimated mean income level was found to be \$1,303, which is not substantially different from the one used in the text.

⁹ According to PWT 9.0, people living in countries in which the per capita income level was lower than the world average were equal to 5.2 billion, which was almost 72.7% of the total world population level of 7.2 billion in 2014.

curve provides information on the distribution of income (or wealth) across the proportion of individuals living in a society. Indeed, it is a graphical representation of a cumulative distribution function that displays relative income shares of different population segments (Kleiber, 2007: 4-9). Briefly, the original Lorenz curve, which mostly relies on micro-level survey data, is constructed in two steps. In the first step, individuals are ranked from the poorest to the richest according to their income levels. Then, starting from the poorest member of the society, the proportion of total income earned is plotted against the corresponding cumulative proportion of the population. Instead of relying on data on individual incomes, this study constructs a curve analogous to the Lorenz curve by using the per capita income level of countries. In this sense, the curve appearing below is just an approximation of the original Lorenz curve. As a first step to generate this macro version of the Lorenz curve, countries were ranked with respect to their per capita income levels, in line with the suggestions mentioned above. Following this, each country's population and GDP levels were converted into relative proportions to respective world totals. Finally, beginning from the poorest nation, the population and GDP shares were added up respectively to generate cumulative proportions of population and GDP values. Figure 1 demonstrates the results of this exercise for the year 2014. Similar to the conventional Lorenz Curve, the 45-degree line shows perfect income equality in the world, whereas the line covered with points represents the actual distribution of income across the world.

Taking a gander at Figure 1 reveals two underlying features of the world income distribution. First, the estimated curve is located on the right side of the perfect equality line, suggesting that global income is distributed unevenly across various population percentiles. According to Figure 1, the total GDP level of the poorest 87 countries, which collectively represent half of the world population, accounts for only 18.7% of the world's total income. In contrast, the far right side of the curve shows that 30% of the global income is concentrated in countries constituting less than 9% of the world's total population. These numbers indicate that living condition of masses shows remarkable variations across the globe.

Figure 1: Lorenz Curve of the World, 182 Countries, 2014



Source: Author's own calculations based on Penn World Table version 9.0.

Second, as one can easily notice, the predicted Lorenz curve contains three smooth line segments, which respectively stands for large individual impacts of the three highest populated countries in the world, namely China, India, and the United States (U.S.). Considering as a whole, the total population and GDP level of these countries account for 42% and 39% of world totals, respectively. However, each of these three smooth lines tells different stories about the average living conditions of their citizens. For instance, the first smooth line, which reflects the impact of India on cumulative population and GDP proportions, is relatively flat compared to the other two segments, suggesting that the contribution of India to the world economy is largely stemming from its huge population level. Data show that while the Indian population share is about 18.1%, its GDP share in the world economy is just 6.5%, suggesting a population elasticity of income level of 0.36 ($6.5/18.1 = 0.36$). In contrast, China, which is responsible for the second smooth part of the curve, has a proportional population share of 19.1% and produces 16.4% of the world's total income. These numbers show that China has a higher population-to-income elasticity level (0.86) compared to India. In other words, the overall income generation capacity of Chinese people is almost 2.4 times higher than that of Indians. The last solid segment of the curve reflects the influence of the U.S. economy. The proportional population and GDP shares of the U.S. are respectively around 4.5%

and 16.1%, meaning that the main contribution of the U.S. to world totals comes from its large GDP value. In addition, these numbers lead to an elasticity level of 3.6, which reflects the higher income generation capacity of the U.S. economy relative to that of China (0.86) and India (0.36). In sum, these figures point out the fact that even among a small sample of countries, the living standards of people can show notable variations. Under the somewhat optimistic assumption of income inequality within national borders is negligible, the estimations based on Figure 1 imply that income difference between randomly selected two individuals living in these countries is ranging from a multiple of 2.4 (between China and India) to 10 (between U.S. and India)¹⁰.

Until now, this section has only touched upon the static part of the income differences between countries. That is, the main focus was on the state of world income distribution at a particular point of the time, namely in 2014. Although conducting such an analysis is the part and parcel of a study regarding cross-country differences in economic development, the figures presented up to this point do not provide any information about the historical evolution of inequalities among nations. However, in order fully to grasp the patterns of income distribution across nations, and thereby to reveal some of the stylized facts, it is necessary to understand the dynamic nature of the above-stated differences in living standards. For that reason, the remainder of this section is devoted to the analysis of the evolution of the world income distribution over the last five decades.

An appropriate way to start analyzing the dynamic nature of income differences is to observe changes in global inequality in the course of time. Figure 2 shows the evolution of income inequality across countries over the period 1960-2014¹¹. The measure of inequality used here is the coefficient of variation (CV), which is defined as the ratio of the standard deviation of income levels to the world

¹⁰ Neglecting intra-country inequalities does little impact on the qualitative results of the discussion. Previous research showed that a large fraction of today's global inequality is stemming from cross-country variations (Sala-i-Martin, 2002: 31-39). For instance, between 1970 and 1998, the within-country inequality accounts for only 21 to 30 percent of the world income inequality (Sala-i-Martin, 2002: 31-33).

¹¹ Figure 2 shows results for a sample of 99 countries with a population of more than 1 million in 2014. Following Mankiw et al. (1992: 413), two of the oil-producing countries, namely, Gabon and Iran, are excluded from the dataset. The sample used in the analysis constitutes 86.7% of the global GDP in 2014 and accounts for 88% of the world's population in the same year.

average¹². Similar to the Gini coefficient, CV is a standardized (scale-free) measure of inequality that shows the magnitude of income dispersion across nations in a given year. In this regard, compared to other measures of dispersion, i.e., simple variance or standard deviation of incomes, which are subject to scale effects, it is a more appropriate tool to examine year-to-year changes in overall inequality among a group of countries¹³.

Figure 2: Dispersion of Real GDP Per Capita, 99 Countries, 1960-2014



Source: Author's own calculations based on Penn World Table version 9.0.

The dotted line appearing in Figure 2 illustrates that the estimated level of CV varies substantially over the last fifty years¹⁴. Between 1960 and 2014, the proportionate dispersion of income has increased by 22.7% (from 100 to 122.7), suggesting an appreciable rise in overall income inequality across countries. Moreover, changes in CV do not follow a linear pattern throughout the examined period. Per contra, there are some notable episodes of rapid increases, slowdowns, or sharp declines. For example, there was a steady increase in cross-country income inequality between 1960 and 1974, which was followed by a relatively stable 5-year

¹² The formula for estimating the coefficient of variation in year t is: $CV_t = \sigma_t / \bar{y}_t$, where CV_t stands for the coefficient of variation, σ_t is the standard deviation of the average per capita income in the world and $\bar{y}_t$ is the global average of the per capita income (weighted by countries' population size).

¹³ For a detailed discussion on various measures of within- and cross-country inequality, see Sala-i-Martin (2002).

¹⁴ For convenience, the estimated CV values are normalized so that the value in 1960 is 100.

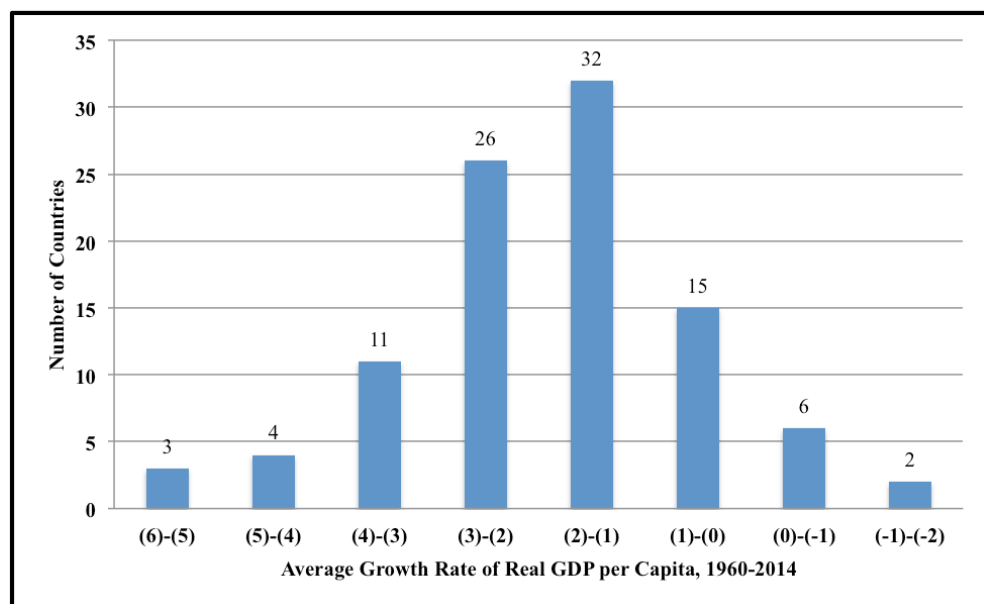
period from 1974 to 1978. Over two time periods, namely 1985-1990 and 1996-2000, there was an upsurge in global inequality: the CV index has increased by 10 and 14 points, respectively. Then, beginning from 2001, the income gap between countries has declined steadily in time. After reaching its peak value of 142 in 2000, the global inequality index has shrunk by 13.6% onwards and reached the value of 122.7 in 2014. In particular, the greater part of this decline (almost 76%) occurred after 2007, which is possibly due to the impact of the global recession on world income distribution.

Overall, Figure 2 demonstrates that, for the world as a whole, income inequality increased consistently in the first 40 years from 1960 to 2000, and then, has fallen slightly in the following years. Especially, the years between 1978 and 2000, during which neoliberal policies have played a prominent role in the shaping of the world economy, have witnessed a rapid increase in global income disparities. Broadly speaking, these findings are in line with the results of several previous works. For example, Pritchett (1997: 9-13) reported no convergence but divergence in income level of countries between 1960 and 1990. Indeed, he showed that income convergence is a rare and artificial phenomenon that occurs when the dataset only comprises a sample of high-income countries or OECD members. When more countries are considered, the analysis confirms increasing income inequality across countries (Pritchett, 1997: 3-6). Barro and Sala-i-Martin (2004: 45-47) and Mankiw et al. (1992: 427) respectively showed that the evidence does not support the idea of absolute convergence in income levels. Their analyses indicated that convergence appears only after controlling for cross-country differences in some key variables such as saving rate, population growth, and level of human capital. Using various inequality measures including the Gini coefficient, Theil Index, and mean logarithmic deviation, Bourguignon and Morrisson (2002: 730-735) affirmed that cross-country income differences have ascended over the period 1960-1992; although they pointed out that the level and the growth rate of global inequality was much higher in the previous years. Quite the contrary, some studies indicated that global inequality is in a downward trend recently. Sala-i-Martin (2002: 28-39) showed that albeit there has been an increase in within-country inequality, the global income inequality, and in particular, the level of cross-country differences has

descended between 1978 and 1998. However, he stated that excluding China from the dataset moderates his optimistic findings regarding the evolution of global inequality in the so-called neoliberal era. All in all, the evidence presented in this chapter as well as the results reported by previous studies reveal that the income gap between countries has widened in the last fifty years. Although there has been a slight decrease recently, the level of income variation between countries appears to be much higher today than it was in 1960s.

Why global inequality has increased in time? Or, to put it another way, what is the main driving factor that gives birth to such increases in income disparities across the world? The first answer that comes to mind is the impact of cross-country differences in long-run growth rates on living standards. Since the development level of a country is deeply bound up with its growth performance in the past years, ascertaining patterns of variations in the growth rate of countries can therefore provide some information about the prevailing differences in economic prosperity and the upward movements in the global inequality. Concerning this matter, Figure 3 displays cross-country differences in growth rates in the form of a histogram for a sample of 99 countries with complete data from 1960 to 2014.

Figure 3: Histogram for Growth Rate of Real GDP Per Capita, 99 Countries, 1960-2014



Source: Author's own calculations based on Penn World Table version 9.0.

In this figure, there are two points to be emphasized. First, the growth rate of per capita income varies substantially across countries. While one set of countries succeeded in growing at unprecedentedly high rates, some others experienced low or negative growth rates. For instance, Figure 3 shows that 7 out of 99 countries have recorded growth rates higher than 4%. Amongst this set of countries, the Republic of Korea, Botswana and Taiwan are the most successful ones with having growth rates higher than 5%. At the other extreme, there are countries like Gambia, Niger, the Democratic Republic of Congo (D.R. Congo), and the Central African Republic, which have witnessed significant falls in their income levels in time. For example, in D.R. Congo, which has recorded a growth rate of -1.96% over the period 1960-2014, real per capita income has dropped from \$2,269 to \$789 –indicating nearly a 65% drop in living standards. However, these two subsets, namely the growth miracles and tragedies, constitute only a small fraction of growth experiences. As illustrated in the figure, a huge quantity of countries (58 out of 99) has grown at relatively moderate rates, ranging from 1% to 3%.

Second, ranking countries in regard to their growth rates reveals some interesting facts about the nature of regional differences in the pace of development. According to the results, there are significant cross-continent variations in the rate of economic growth¹⁵. For example, evidence shows that the Asian continent seems to have fertile soil that offers ideal conditions for economic growth: 11 out of 20 of the fastest-growing economies of the world are from Asia. Indeed, Asian nations constitute 85.7% of the countries that have recorded growth rates higher than 4%. On the other hand, African countries dominate the negative end of the spectrum. Of the 23 countries that have grown at an annual rate of less than 1%, 17 are in Africa, which is in line with the relatively low level of living standards in the region observed today. Compared to the extreme positions of Asian and African economies, Europe and the Americas show up in the middle part of the ranking. For example, a bulk of European countries (14 out of 17) is placed in the upper-middle segment of the ranking (between 21th and 48th places), with growth rates ranging from 1.36% to

¹⁵ The classification of countries by continent is from the United Nations Statistics Division (UNSD). For further information, see: The United Nations (1999), *Standard Country or Area Codes for Statistics Use, 1999 (Revision 4)*, <https://unstats.un.org/unsd/methodology/m49/overview> (13.04.2020).

2.80%. Between 1960 and 2014, only two of the European countries, namely Romania and Ireland, have recorded growth rates higher than 3%. In contrast to European and Asian economies, many countries in the Americas show relatively poor growth performance. Approximately 83% of the countries in the Americas (19 out of 23) experienced growth rates lower than the average annual growth rate of world per capita GDP, 2.3%. This proportion is slightly lower than the one observed in Africa (84%) but much higher than that of Europe (53%) and Asia (26%).

One last point worth mentioning is the notable intra-continental differences in economic performance. Results imply that instead of following similar development paths, countries within the same continent have experienced quite different growth rates in the last fifty years. For instance, the standard deviation of growth rates is respectively 1.41 and 1.45 in Africa and Asia, suggesting a considerable amount of within-continent variation in the pace of development for these two regions. Quite the contrary, the extent of such differences is relatively moderate in Europe. As stated above, the growth rate of most European countries is around 2%, and the corresponding standard deviation of growth rates is only 0.56, which collectively implies that within-continent variations are less pronounced in Europe than they are in other continents. As an example, the growth rate difference between the fastest- and slowest-growing European countries is only 2.6%. Although such a difference is important on its own terms, it corresponds to a much lower level of discrepancy compared to the ones observed in Asia (4.7%) and Africa (7.5%). Lastly, the computed growth rate dispersion for the Americas is equal to 0.88, which denotes that the magnitude of cross-country variability in economic performance within this region is higher than that of Europe but is relatively low in comparison to the other two other continents. However, albeit the overall variability in the Americas seems to be low, the data show that there are dramatic performance differences between some countries within this region. For instance, the growth rate of the Dominican Republic is 3.5% higher than that of its eastern neighbor, Haiti, over the last five decades. To sum up, these findings reveal that besides inter-continental differences in economic performance, there are a substantial amount of intra-regional variations as well.

Broadly speaking, all these results show that the magnitude of the cross-country variations in growth rates is quite large. While a group of nations succeeded

in growing at an annual rate of 5% or higher, some others recorded low or negative growth rates. To assess the quantitative importance of such differences, consider two countries that have a per capita income level of \$2,500 in 1960 but respectively grow at an annual rate of 5.5% and 0.5% for the next 54 years. Under these assumptions, in 2014, a fast-growing country would reach an income per capita level of \$48,730, which would be approximately 15 times higher than the income level of a slow-growing country (\$3,275). This implies that a 5 percent difference in growth rates can directly change the economic fates of countries. However, one may think that such an exercise is far from the reality since it is unlikely for countries with the same initial income levels to follow such a different development path. Quite the contrary, this exercise is the closest approximation to reality as it basically simulates the actual development process of Taiwan and Zambia over the last 54 years. In 1960, for instance, the income levels of Taiwan and Zambia were respectively \$2,417 and \$2,647, and their actual growth rate difference over the examined period was 4.8% ($5.4 - 0.6 = 4.8$). Then, in 2014, Taiwan reached an income level of \$44,328, which was almost 12 times higher than the actual income level of Zambia (\$3,726). This example simply shows the extent to which high growth rates affect living standards in time.

Considering these results, it is reasonable to think that variation in the rates of economic growth is one of the root causes of observed divergence in income levels. To some extent, this is a truism: differences in growth rates can bring about differences in living standards, as shown in the preceding paragraph. However, it is a well-known fact that the appearance of income divergence/convergence is contingent on factors such as the degree of equality in initial income distribution or the relative growth performance of developed and underdeveloped countries. Accordingly, focusing solely on absolute growth rates can be a parsimonious approach to explain prevalent trends in cross-country income differences. To be able to gain a deeper insight into the dynamic nature of global income inequality, it is necessary to observe the relative development performance of countries over time. Regarding this issue, this study applies a two-step strategy. Firstly, countries are ranked according to their per capita GDP levels in 1960 and 2014, respectively. Then, each country is classified in one of the following five income categories: the top class, the upper-

middle class, the middle class, the lower-middle class, and the lowest class. For each year, the threshold income levels that separate groups from each other are determined according to the computed world average and its multiples¹⁶. Table 1 introduces the classification scheme and the threshold values used to form different income groups.

Table 1: Threshold Values of Income Groups

Income Group	Threshold Income Level
The Top Class	$2 * \mu_t \leq X_{it}$
The Upper-Middle Class	$1.5 * \mu_t \leq X_{it} < 2 * \mu_t$
The Middle-Class	$\mu_t \leq X_{it} < 1.5 * \mu_t$
The Lower-Middle Class	$0.5 * \mu_t \leq X_{it} < \mu_t$
The Lowest Class	$X_{it} < 0.5 * \mu_t$

Notes: X_{it} stands for real GDP per capita level of country i in year t . μ_t is the mean income level in the world in year t .

Secondly, in compliance with the definitions provided in the table, a Markov transition matrix is constructed to examine the movements of countries across various income categories over time. Briefly, an income transition matrix is a square matrix that shows the probability of moving from one income group to another in a given period of time. In this respect, it provides information on the probability distribution of possible development paths that a randomly selected country or a country group can follow. For that reason, some of the previous studies used Markov transition matrices for forecasting purposes –i.e., estimating the final distribution of countries across various income categories for a given time and initial distribution vector (Kane, 2016, 3-8). However, using a transition matrix to estimate world income distribution at a future date can be misleading, as such calculations are mostly based on fixed probability ratios, which only reflect patterns observed in the past and may likely change during the examined period. On that account, instead of using it for forecasting purposes, this study employs the transition matrix in a retrospective manner; that is, to observe what has happened to global income distribution in the past.

¹⁶ World GDP per capita income in a year (μ_t) is calculated by dividing the total GDP level of all countries in year t , by the total population of those countries.

The primary objective of following such an approach is simply to track the relative development performance of countries, and thereby, to identify several patterns of the evolution of the world income distribution over time. To be more specific, the main purpose is to provide descriptive answers to questions like: What percentage of economies that were initially rich is still retaining their seats today? Or, which one was more likely for a member of the lowest class: catching up the high-income countries or falling back in the development race?

Table 2: Transition Matrix (in percentages), 99 Countries, 1960-2014

1960-2014	The Top Class 2014 (25)	The Upper- Middle Class 2014 (4)	The Middle Class 2014 (9)	The Lower- Middle Class 2014 (20)	The Lowest Class 2014 (41)
The Top Class 1960 (16)	100.0	0.0	0.0	0.0	0.00
The Upper- Middle Class 1960 (5)	60.0	0.0	20.0	20.0	0.00
The Middle Class 1960 (12)	16.7	25.0	16.7	33.3	8.3
The Lower- Middle Class 1960 (23)	13.0	4.3	17.4	30.4	34.8
The Lowest Class 1960 (43)	2.3	0.0	4.7	18.6	74.4

Source: Author's own calculations based on Penn World Table version 9.0.

Table 2 illustrates the constructed transition matrix for the 1960-2014 period. Before interpreting the results, several things should be mentioned up-front. First, each number in parenthesis that appears under the headings stands for the number of countries belonging to a particular income class in the corresponding year. Second, the elements of the main diagonal indicate the percentage of countries remaining in the same income category over the analyzed period. That is, they are standing for the share of “stagnating” countries in a given income class. On the other hand, the off-diagonal elements of each row illustrate the ending year distribution of countries that were initially members of a particular income class in 1960. As an example, the first

number appears in the third row of the matrix indicates that 16.7% of the countries (2 out of 12), which were initially categorized into the middle class in 1960, have moved up to top-class in 2014. In a similar vein, the value in the fourth column of the third row implies that 33.3% of the former middle-class members (4 out of 12) are now classified in the lower-middle class¹⁷.

There are at least four salient findings jumping out from Table 2. First, results imply that global income distribution is positively skewed. As the numbers in parenthesis point out, a substantial fraction of countries have GDP per capita levels lower than the corresponding year's world average. In 1960, for instance, 66 out of 99 countries were members of the lower-middle and lowest classes, in which income levels are lower than the world income per capita level of \$4,079. Although the total number of members of these two classes has declined to 61 in 2014, it remains to account for more than 60% of the whole sample. Quite the contrary, the number of countries that enjoy income levels higher than 1.5 times the world average are respectively 21 in 1960 and 29 in 2014, suggesting that only a small fraction of countries have significantly better living conditions compared to world standards.

Second, estimations reveal that moving across income categories is a rare event during this period. Between 1960 and 2014, the overall mobility rate is only 42%, connoting the fact that the majority of the countries in the world have retained their relative positions in the ranking over time. Besides this, figures that appear in the main diagonal of the matrix imply that the mobility traits of countries show remarkable variations across income categories. According to the table, while a large fraction of countries belonging to the top and lowest class categories in 1960 have remained within the same income category over time, most countries initially standing in the middle segment of the income ranking moved to other categories in 2014. For example, all of the 16 countries that were initially categorized in the top class retained their exclusive status in 2014 as well. Similarly, a great majority of countries that were initially members of the lowest class category have continued to lag behind in the development race. Almost 74% of the lowest class countries (32 out of 43) continued to live with income levels less than half of the world average in 2014. These findings imply that the initial income level is a determining factor of

¹⁷ See Appendix Tables 1-2 for the complete list of countries by income groups in 1960 and 2014.

economic performance for most of the countries in the top and lowest class. Compared to these two extreme categories, results show that countries that were initially a member of one of the three middle-income categories, namely, the upper-middle, the middle, and the lower-middle classes, are more likely to move across income classes. Of the 40 former members of these classes, 30 countries have moved to another income category in 2014, suggesting an overall mobility rate of 75%. This indicates that, for the period under consideration, a significant portion of transitions between groups is made by countries belonging to middle-income categories.

Third, Table 2 demonstrates that there are successful as well as ill-fated countries around the world. According to results, 27 out of 99 countries have made transitions into higher income categories during the analyzed time interval. Among the sample of climbing countries, a group of Asian economies namely, the Republic of Korea, Hong Kong, Singapore, and Taiwan are the most successful ones, as each of these countries has moved up at least three income categories and became a member of top-class category in 2014. In particular, the Republic of Korea is the only country in the world that has moved from the lowest class to the top class within a period of less than sixty years. Besides these fast-growing Asian nations, the performance of two former lowest category members, e.g., Romania and Botswana, is also attention-grabbing in the sense that each of them managed to climb up two classes over time and reached the middle-income status in 2014. As shown in the table, there are a number of success stories among the middle and the upper-middle class countries as well. The first number that appears in the second row denotes that 60% of the former members of the upper-middle class graduated to the top-class category in 2014. Moreover, almost 42% of the middle-income countries have made transitions to either the top class or the upper-middle class in time, which implies that the middle-income trap is not the common fate of all countries across the globe.

On the other side of the coin, evidence shows that 15 out of 99 countries in the world have experienced disappointing development performances. In this sample of “falling” countries, Venezuela and Nicaragua stand out as the worst performers. During the period 1960-2014, Venezuela, which was one of the richest 25 countries in the world in 1960, has traversed from the upper-middle class to the lower-middle class. Similarly, Nicaragua, an ordinary member of the middle-class category in

1960, fall down by two income categories and attained the lowest class status in 2014. Apart from these examples, one-third of the middle-class members –namely, Algeria, Costa Rica, Jamaica, and South Africa- have shown relatively slow economic progress in time and become members of the lower-middle class. Similarly, 34.8% of the initial members of the lower-middle class, which are all from Africa and the Americas, have moved down to the lowest income class in 2014.

Lastly, in parallel with the results on growth rates, evidence suggests that there are notable inter- and intra-continental variations in the level and speed of economic progress. According to the results, while European countries have dominated the top-class category during the entire period, many African countries clustered in the lowest class. For instance, in 1960 and 2014, the proportion of European countries in the top-class category is respectively 69% and 56%, whereas the share of African countries in the lowest income category is more than 65% in both years (65% in 1960 and 73% in 2014). Again, analyses point out the successful performance of a group of Asian countries over the last fifty years. In 1960, only 3 out of 19 Asian countries, namely, Israel, Japan, and Turkey, have income per capita levels higher than the world average, whereas this number increased to 8 in 2014. Moreover, in 1960 only 6% of the top-class members (1 out of 16) were located on the Asian continent. But since 1960, this share shows a massive increase and reached a level of 24% in 2014 (6 out of 25), reflecting the rapid economic progress in some of the East Asian countries. Besides this, results show that most countries in the Americas stand in the middle segment of the ranking. Among the countries in this region, 61% of them (14 out of 23) were members of one of the three middle-income categories in the years 1960 and 2014. Indeed, only two nations in the Americas (the U.S. and Canada) have ranked in the top income category during the entire period.

In addition to those inter-continental differences in economic performance, there are substantial within-continent variations as well. In Asia, for instance, the ratio of the income per capita level of the top country to that of the bottom country (briefly, top-to-bottom ratio) is 12.4 in 1960, which indicates that there is almost 12-fold income difference between two countries in the same continent. On the other hand, the same figure is respectively 13.8, 14.1, and 23.1 for Africa, Europe, and the Americas, suggesting that the level of income divergence in each of these regions is

even more than the Asian continent. Furthermore, in 3 out of 4 continents, the top-to-bottom ratio has increased in time and reached a level of higher than 30 in 2014. This means that in the majority of the continents the intra-regional income gaps between countries have widened over the last five decades. From 1960 to 2014, the only continent that has witnessed a drop in this ratio was Europe (from 14.1 in 1960 to 3.1 in 2014). However, this relative fall in income differences, which seems to imply an intra-regional convergence among European countries, is only in proportional terms. In fact, the absolute income difference between the top and bottom countries in Europe has increased more than two times during the analyzed period¹⁸.

Other than income levels, the relative development performance of countries within the same continent is quite dissimilar as well. Consider two examples from two different continents. As stated above, a number of African countries show relatively poor economic performances over the last fifty years. As a result, they attained a lower income class in 2014. However, during the same period, two of the African countries, Botswana and Mauritius, have recorded growth rates higher than the world average and become members of the middle-income class, which emphasizes the fact that being in Africa, per se, is not an obstacle for economic progress. In contrast to Africa, the Asian continent is famous for its rapidly growing “tigers” such as the Republic of Korea, Singapore, China, Hong Kong, Thailand and etc., which respectively managed to make transitions into a higher income class between 1960 and 2014. However, these are not the only countries in Asia. A set of countries, including Bangladesh, the Philippines, and the Syrian Arab Republic, which had higher income per capita levels in 1960 compared to most “tigers” cited above, have remained as members of the lowest class category during the entire period. Indeed, their respective income levels account for only a small fraction of that of the tigers today. In light of these examples from different continents, one can safely state that being in the same region or having similar income levels initially does not guarantee a uniform development path for countries.

As noted above, the primary concern of this section is to shed light on some of the static and dynamic features of cross-country differences in income levels. In line with this intention, various measures and analyses are used so far to observe the

¹⁸ In absolute terms, the income gap between top and bottom countries has increased from \$18,297 in 1960 (between Switzerland and Romania) to \$43,457 in 2014 (between Norway and Romania).

evolution of the world income distribution over the last five decades. In a nutshell, results based on this effort demonstrate that there are at least four stylized facts about the distribution of income levels across the globe:

- 1) There are significant and persistent differences in income levels across countries.
- 2) Global income inequality has increased over time.
- 3) The speed of economic progress varies substantially across nations.
- 4) There are both inter- and intra-continental differences in economic performance.

Broadly speaking, these empirical regularities point out the diverse nature of economic development across the world, which put down the fact that there is a huge need for a comprehensive theory to understand and, if it is possible, to resolve such economic differences between countries. However, as the stylized facts above imply, this is not an easy task. An elegant approach should be capable of providing simultaneous explanations for increasing global inequality, large cross-country variations in living standards, and regional and intra-regional differences in economic performance. In the literature, there are innumerable studies that have tried to address these issues. Nevertheless, only a few of them provided ideas compatible with the identified patterns of the world income distribution. In order to give a point of view about the pros and cons of these approaches, the following section summarizes and evaluates the competing theories in comparative development literature that aimed to explain the above-mentioned facts.

1.3 LITERATURE SURVEY

As it is shown in section two, the period succeeding World War II has witnessed large and growing disparities in income levels among the nations of the world. While a few numbers of initially prosperous countries have enjoyed high living standards due to their exclusive positions in the world income ranking, many others have suffered from limited economic opportunities during the whole period.

Besides these abidingly rich and poor countries, some nations have undergone a radical change in terms of their economic conditions. Amongst this set of countries, some of them show remarkable success in increasing average living standards of their citizens in time, whereas others have failed to make progress and obliged a large fraction of their society to live in conditions even worse than those at the beginning of the period.

Due to these well-documented differences, much of the recent research in economics is headed towards understanding staggering contrasts in development experiences. As mentioned briefly in the introduction part, previous studies have proposed several theories and hypotheses to elucidate international differences in economic progress. As a first step, several writers have highlighted cross-country variations in the level of technology and productive capacity as the main causes of global income divergence (Easterlin, 1981: 3-4; Landes, 1990: 2-4, 11-12; Mankiw et al., 1992: 409-433). The logic behind this approach is straightforward: countries that had better technological apparatus and more productive inputs have produced much more output than their counterparts in time, and thereby, outpaced others in the race of economic progress. Therefore, for the proponents of this tradition, the main reason that makes Britain and other following European countries different from the rest on the eve of the Industrial Revolution, or, the distinguishing character of some of the Asian nations that have succeeded in catching up with industrialized countries recently, is simply the superiority that these countries have in technology and productive resources, which makes it possible for them to produce something in a more efficient or a cheaper way (De Long, 1988: 1138; Landes, 1990: 3-4). That is, the diversity in the productivity levels is the prime mover of the established, sustained, or widened/narrowed income differences across countries and over time. In this respect, many studies on comparative development have focused on factors related to technology, or more generally to productive capacities, such as saving/investment rates, overall education levels, integration degree to international trade, innovative capacity, absorption capabilities, human capital, and physical capital, to explain observed divergence among economies (Easterlin, 1981: 5-17; Frankel and Romer, 1999: 381-395; Mankiw et al., 1992: 409-433; Sachs and Warner, 1997: 184-188). In particular, several studies have shown that such variables

are empirically related to the economic performance of nations (Mankiw et al., 1992: 409-433; Sachs and Warner, 1995: 8-23, Sachs and Warner, 1997: 186-188).

Subsequent research has gone into more depth and pointed out that most of the variables mentioned above can only be considered as the starting steps of an examination of global income distribution: what really causes variations in these variables and living standards is more fundamental. To be more specific, disparities in the level of accumulated human capital, technology, knowledge, integration to international trade, and investments are only a function of the deeper determinants. In literature, the three major factors that are often highlighted in this regard are institutions, geography, and culture/religion, respectively. The common argument voiced by proponents of each of these explanations is that both prevailing and historical variations in productivity and, in particular, in income levels are only the reflections of global heterogeneity in the distribution of institutional, geographical, and cultural factors. As the review of the literature shown below reveals, this argument is sound and pertinent in many cases. In broad terms, existing literature provides supportive evidence for the view that economic performance is directly related to at least one of these three factors, although the weight and magnitude of the respective influences of them vary significantly by time and case under research. In this sense, to provide a better understanding of key determinants of economic progress, the remaining part of this section is devised to elaborate on hypotheses based on these three factors. In the first part of this section, these views are discussed respectively, whereas the last part focuses on the relative compatibility of each of these approaches with the empirical regularities documented above.

Before diving directly into discussions on various hypotheses, it is convenient to start with the purpose of conducting such a literature review. It is a well-known fact that there are countless numbers of factors that may influence a country's economic performance over time. To some extent, it is obvious that any factor can play at least a modest role in determining a country's or a particular group of countries' economic development trajectory. Nevertheless, documenting every unique or endemic factor that seems to affect economic performance is quite unfruitful in the sense that such an effort would provide only the pieces of a puzzle – not the puzzle itself. In general, however, the economics discipline is desperately in

need of generalizations and identification of common features to constitute relevant theories about the problem at hand. For that reason, the focal point of this section is not counting every possible explanation in turn; instead, the main aim is to address the relative performance of the three prominent views suggested by the comparative development literature. Here, the main criterion for the evaluation of these hypotheses is the extent to which they meet affirmed facts about the world income distribution: Does a particular hypothesis account for the prevailing ordering and changes in the income ranking? Or, does it have the ability to explain a large fraction of the inter- as well as intra-regional divergence in income levels?

On the other hand, it should be noted that accepting the reasoning of one strand of literature does not necessarily exclude other explanations. As is discussed below, there are complex and mutual relationships between geographical, institutional, and cultural factors, which in some cases, create difficulties in defining the relative role of a particular variable. Moreover, most of the time, these factors reinforce their respective impacts and thereby exert a collective effect on economic performance. On that account, one should abstain from interpreting evidence on each of these theories in a strict manner.

To start reviewing this extensive literature, consider first the relationship between institutions and economic performance. In comparative development literature, a growing body of research accentuated that differences in institutional settings are the ultimate sources of variations in economic progress: countries that have succeeded in developing better economic and political institutions are the ones that have shown significantly better economic performance over time (Acemoglu et al., 2001: 1369-1373; Acemoglu et al., 2002: 1262-1269; Acemoglu et al., 2014: 1; Easterly and Levine, 2003: 31-37; North, 1991: 108-111; Rodrik et al., 2004: 132-136; Scully, 1988: 657-663; Sokoloff and Engerman, 2000: 223-230). The essence of this hypothesis relies upon the link between institutional structures and behaviors of the economic agents. As stated in the introduction part, institutions specify the incentive mechanisms by defining constraints and rules in economic, political, and social areas (Matthews, 1986: 904-906; North, 1991: 97). In fact, they provide people with the necessary information to involve in economic interactions (Boland, 1979: 963). Accordingly, the institutional framework of an economy directly

influences the motivations or intentions of fundamental decision-making units, namely, individuals and firms, for engaging in economic activities such as production, consumption, trade, working, and investment (Greif, 2006: 3-5). The collective outcome of these individual behaviors, given the underlying institutional structure, then, underpins a country's economic performance by determining the overall level of productivity and the efficiency in resource allocation. For that reason, developing a set of "inclusive" institutions that facilitates productive activities is considered as a *sine qua non* for economic progress.

Briefly, the institutions hypothesis asserts that institutions are one of the most important determinants of economic development. However, this presumption cannot be assessed profoundly enough without examining the reasons for their existence: Why societies need institutions? Or, what is the main rationale for designing and developing efficient institutions? In essence, the answers to these questions lie in the nature of human interactions. Broadly speaking, societies devise institutions to be able to live in a peaceful environment and to bring order to social life (Diamond, 2004: 357-392; Olson, 1993: 567-569). That is, the main aim is simply to enhance human cooperation in order to solve disagreements arising from social interactions (Boland, 1979: 964; Greif, 2006: 29-53). The same is true for economic relations. Even in their simplest form, economic interactions incorporate certain information and transaction costs stemming from the arrangement, measurement, monitoring, and enforcement problems incident to the exchange process (Coase, 1937: 390-398; Coase, 1960: 15; Leblang, 1996: 8; Matthews, 1986: 904-906; North, 1991: 98). Thus, every transaction entails a mutual trust environment and at least a modest level of cooperation between involving parties to overcome emerging costs and establish a beneficial exchange agreement. This is exactly where institutions come into the picture: by lowering uncertainties resulting from transaction and information costs, institutions grease the skids for a mutually profitable trade, and accordingly, enhance the total number of productive activities in an economy (Leblang, 1996: 7-8). In this regard, they appear as an integral part of a societies' economic organization scheme.

To be able to cope with the concomitant costs of economic activities, every human community developed and acted upon a set of institutions throughout history, although the scope, nature, and efficiency of these institutional settlements vary

significantly by time and society. For instance, North (1991: 98-102) put forth that in the early stages of social development, where most economic transactions are carried out on a personal, permanent, regional, and repetitive basis, societies generally rely on informal and primitive institutions such as traditions, norms, personal relations, and codes of conducts imposed by cultural or religious values to maintain economic activities. The fundamental reason for societies to develop and abide such tentative institutional constraints is just the relative efficiency that these institutions bring into the trade via either lowering transaction costs or increasing the trust environment for the participating agents. For that reason alone, these institutions have played a significant role in the arrangement of economic activities in a large part of history.

Nevertheless, albeit they are useful in their own terms, most of these elementary institutional constraints begin to lose their effectiveness in the process of social progress due to the changing nature of economic interactions. With the emergence of modern societies, in which the majority of economic activities have become complicated, impersonal, long-distance, and precarious, more specialized forms of institutions, namely formal institutions, were generated to solve coordination problems between agents. Among these, property rights, legal systems, constitutions, and statutes have appeared as peculiarly vital for lowering transaction costs and sustaining a large number of exchanges in a modern economy. In an early study, Coase (1960: 15-16) points out that given the transaction costs, economic systems need well-defined legal rights to be able to smooth the operation of market forces and promote efficiency in the allocation of resources. Additionally, some authors assert that other than solely solving primary coordination problems, these institutions support economic progress in a number of ways, namely, by facilitating investments, specialization, technological progress, and capital accumulation (Acemoglu et al., 2001: 1369; Dias and Tebaldi, 2012: 301; Greif, 2006: 3-4; Knack and Keefer, 1995: 210-211, 219; North, 1991: 100-102; Rodrik et al., 2004: 146-147; Scully, 1988: 653-662; Tavares and Wacziarg, 2001: 1344-1348). For instance, North (1991: 101) articulates that capital accumulation and technological progress, which are generally cited as the backbones of the sustained economic performance, are heavily dependent on the development of institutions such as secure property rights and rule of law that ensure people to reap the benefits of their investments and

labor. This implies that the cross-country variations in the levels of accumulated capital and technology can only be regarded as a function of differences in the institutional framework. In the literature, this hypothesis receives some support from a number of theoretical and empirical studies. For instance, formulating a theoretical model, Dias and Tebaldi (2012: 303-307) show that the return on and the accumulation of human capital depend directly on the institutional quality of an economy; whereas Rodrik et al. (2004: 146-147) report that better institutional framework is associated with higher levels of productivity, human capital, and physical capital. In respect to these arguments, institution-based explanations suggest that, rather than being the ultimate source of income differences, technology and capital accumulation are mere results of disparities in institutional developments such as private property rights, efficient capital markets, and effective juridical systems.

The discussion so far makes clear that high-quality institutions play an important role in the configuration of modern-day economies: they lower transaction costs, enhance economic cooperation, increase efficiency in resource allocation, and facilitate the functioning of markets. Thus, constituting institutions such as protected property rights, effective and impartial legal systems, and well-functioning regulatory bodies are regarded as a necessity for countries to increase productivity and achieve better living standards (Scully, 1988: 661-662). However, such institutions of high quality do not spring out spontaneously. That is, they are not manna from heaven that appears instantly and benevolently to support economic activities. In contrast, the development of institutions occurs in the course of time and generally entails the existence of sovereign authority (Olson, 1993: 572). To put it more explicitly, the impersonal nature of effective institutional mechanisms mentioned above requires a third party involvement into the economic system; an agent, which can develop institutions, and have the ability to arrange, regulate, and monitor economic exchanges due to its sanction power. Throughout history, most of these functions are carried out by governments, which are the competent authorities within national borders. By providing (or incorporating) relevant apparatus such as laws, police power, courts, and regulatory and supervisory authorities, the government engenders the institutional matrix of an economy and is seen more or

less as the main responsible agent for the institutional evolution (Coase, 1960: 17; Diamond, 2004: 373-376; North, 1991: 109; Olson, 1993: 572). However, it is a well-noted fact that governments are not the most efficient, fair, and unbiased units that always develop the most constructive rules and institutions for the beneficence of society. Quite contrarily, history is full of examples that show how governmental bodies or their representatives fail to maintain law and order, look after social wellbeing, and design an effective institutional environment (Acemoglu and Robinson, 2020).

In the literature, it is shown that the underlying factors for the occurrence of such failures are closely related to the problems and inequalities embodied in the political area. For instance, Dahl (2018: 53-71) states that there are significant differences in talents, incentives, resources (time and wealth), and information among the members of the society, which naturally cause disparities in achieving and affecting electoral processes. As historical experiences have shown on several occasions, those differences ultimately translate into distortions in executive functions: governments usually become more responsive to particular interest groups that have relatively more resources and lobbying power to manipulate political processes (Becker, 1983: 373-394). In some extreme cases, these powerful groups can directly take control of the government and become the ruling class for long periods. Unless there are strong opposing forces or balancing and monitoring bodies, the establishment of such domination over the political sphere mostly transforms into an authoritarian regime, under which the political system becomes only a servant of the ruling elite. Naturally, this kind of deformity in the polity, that is, the emergence of an authoritarian government, or more broadly, of special interest groups that have control over the most political processes, creates a straightforward threat against the functioning of the economic system, as it paves the way for ruling elites to exploit, expropriate and redistribute resources by altering institutional structures, or following policies favoring themselves (Acemoglu et al., 2014: 4; Tavares and Wacziarg, 2001: 1344). For that reason, the institutions hypothesis suggests that the development of an effective institutional structure presupposes not only arrangements about effective protection of property rights, but also regimes, rules, and legislative regulations that constraints executive power (Acemoglu et al., 2001:

1395-1396; Acemoglu et al., 2002: 1262-1263; Olson, 1993: 571-574). That is, to constitute a high-quality institutional framework, countries should also envisage and develop political institutions that reflect a society's choices on an equal basis, and in particular, that have the capacity to impede the concentration of political power in the hands of a narrow section of the society.

In the institutional theory, democratic regimes are regarded, at least in the dominant view, as more conducive to economic development than the alternatives (Acemoglu et al., 2014: 4; Drury et al., 2006: 124; Leblang, 1996: 18-19; Olson, 1993: 571-573; Przeworski and Limongi, 1993: 57-58). As opposed to authoritarian regimes, democracies can provide a freer political environment that fosters political competition among citizens and encourages the participation of the majority of the society into the political processes (Decker and Lim, 2008: 702). In addition to this, such regimes are mostly accompanied by civil liberties, and freedom of press and expression, which collectively facilitate checks and balances on government by enhancing the monitoring capacity of a society (Drury et al., 2006: 133; De Haan and Siermann, 1995: 175; The World Bank, 1991: 133). Therefore, compared to others, it is more likely for democratic governments to develop and support growth-enhancing institutions such as secured private property rights, impartial legal systems, and trustable constitutional guarantees against seizure (De Haan and Siermann, 1995: 179-181; Leblang, 1996: 18-19; Olson, 1993: 571-573). Although it is not impossible or unseen, the emergence of such institutions is less likely under authoritarian regimes, kingdoms, and other undemocratic practices, as those regimes have an inherent tendency to suppress freedoms, to break down the separation of powers, and to follow extractive policies, which together curtail a significant part of the productive activities in an economy and mostly serve to the ruler or the ruling elite (Drury et al., 2006: 124; Olson, 1993: 571-574).

Contrary to this idea mooted by the institutions hypothesis, some argue that democracies have no edge over authoritarian regimes in terms of economic performance. According to this line of thinking, regarding the redistribution and immediate consumption demands of the societies, democratic regimes, due to their nature, are more responsive than the authoritarian ones (Drury et al., 2006: 124-125; Tavares and Wacziarg, 2001: 1344). For that reason, compared to the authoritarian

regimes, representative democracies are more prone to implement unproductive redistribution or consumption policies, which generally lead to distortions in the resource allocation mechanisms that lower both investments and economic performance in the long run (Decker and Lim, 2008: 700; De Haan and Siemann, 1995: 177-178; Drury et al., 2006: 124-125; Przeworski and Limongi, 1993: 54). In contrast to their democratic counterparts, authoritarian regimes, which have the potential capability to suppress or to resist against such demands, can implement more effective growth-oriented policies, including compulsory saving/investment rules. In this respect, they can be more dexterous to foster capital accumulation, production, and economic progress in comparison to democracies (De Haan and Siemann, 1995: 177-178; Przeworski and Limongi, 1993: 54-55). Indeed, a number of studies imply that, in some cases, authoritarian regimes show better performance than the democratic ones in terms of either providing assurance for property rights, or directing resources in areas where their productivity levels are higher. For instance, Acemoglu et al. (2014: 1) and Rodrik et al. (2004: 197) point out the case of China, which exemplifies a situation for the occurrence of a successful economic performance despite the prevailing authoritarian practices. Rodrik et al. (2004: 197) state that, although China has an authoritarian government and a socialist legal system that has no formal institutional arrangement for private property rights, it manages to record high growth rates with the help of investments made by both foreign investors and domestic actors who continue to feel secure under the prevailing local institutional arrangements.

Supportively, the World Development Report of the World Bank (1991: 132-133) stated that authoritarian regimes in some of the East Asian countries recently, and in a group of countries including Chile, Brazil, and Spain in the past, have shown better growth performances than the majority of the democratic nations around the world. On the other hand, some researchers show that such situations, i.e., the simultaneous existence of well-secured private property rights and authoritarian practices, are generally rare exceptions in economic history. For example, Acemoglu et al. (2001: 1376-1377, 1395), and Easterly and Levine (2003: 4-6, 8-11), respectively, argue that in most of the formerly colonized nations (e.g., those in Africa or South America), where the economy and the political processes were

controlled by a small elite during the pre-independence period, the extractive institutional structures, including forced labor practices in agriculture and mining or unsecured property rights for the broad section of society, were maintained or intensified by the ruling class that had disproportionate political power in the post-colonization period. In contrast, some regions, e.g., North America or Australia, which were characterized by well-protected property rights and democratic practices in the early days of colonization, have continued to provide an inclusive economic environment for their inhabitants. Depending on these discussions, the widely accepted idea among the adherents of the institutional approach is that political environments with more freedom and egalitarian structures in voting processes are more conducive to the establishment and maintenance of an inclusive institutional framework (Acemoglu et al., 2014: 4; Acemoglu and Robinson, 2013: 79-83; Przeworski and Limongi, 1993: 57-58; Olson, 1993: 571-574).

To sum up, the institution hypothesis asserts that the evolution of cross-country differences in economic prosperity is closely related to the emergence of institutional differences in the political and economic realm. Moreover, this approach suggests that institutional quality does not merely affect economic performance, but also influences other factors that are considered as the sources of economic growth such as investment rate, capital accumulation, and technology. For that reason, it provides a more comprehensive explanation than those theories that solely emphasize factors related to productive capacity. Further, the theoretical background offered by the institutions hypothesis of development equips researchers with reasonable means to examine the stylized facts noted in the previous section. For instance, since institutional quality measures have been changing over time (although at a relatively slow pace unless there are structural breaks such as riots, civil wars, or military coups), the institutions hypothesis provides a theoretical framework that is capable of capturing the time dimension of fluctuations in economic performance. Besides this, as institutional structures show substantial variations across countries even in the same region (e.g., Botswana vs. Zimbabwe) or even with a similar cultural heritage (e.g., South Korea vs. North Korea), the institutions hypothesis stands out as a capable theory to elucidate contrasting economic performances of countries with similar geographic or cultural characteristics. In regard to these facts,

it is considered as a decent candidate to puzzle out both historical and modern-day differences between economic performances.

However, being a reasonable candidate is not a sufficient condition for any particular theory to be accepted as the ultimate explanation of cross-country differences in economic development. What is needed is empirical support. With the awareness of this fact, a significant amount of papers in the literature has focused on the relationship between institutional structures and several economic measures related to growth and development performance. In general, previous research has shown that an inclusive institutional framework, especially in the economic realm, is conducive to economic performance. Employing various methodologies and measures, a number of empirical studies reveal that countries with high-quality institutions, such as well-protected property rights, low expropriation risk, efficient bureaucratic, legislative, or regulatory systems, and democratic regimes, show significantly better economic performance in the last few decades compared to those surrounded by extractive institutions (Acemoglu et al., 2014: 7-24; Assane and Grammy, 2003: 1813-1817; Knack and Keefer, 1995: 216-220; Leblang, 1996: 14-20; Mauro, 1995: 700-705; Rodrik and Wacziarg, 2005: 51-55; Sachs and Warner, 1997: 186-188; Scully, 1988: 657-662). Furthermore, some studies provide supportive evidence for the view that institutional differences in the economic and political realm do not only account for recent differences between economic performances, but also do explain the contrasting development experience of countries since the early days of the colonial period. Using differences between settler mortality rates as a proxy for capturing institutional variations among the ex-colonies, several studies, including Acemoglu et al. (2001: 1383-1396), Acemoglu et al. (2002: 1269-1278), Decker and Lim (2008: 708-721), Easterly and Levine (2003: 26-33), and Rodrik et al. (2004: 138-153), show that a significant portion of the cross-country differences in income levels today stems from the differentials in institutional settings established at the time of colonization. Evidence shows that while regions (or countries), which were suitable for Europeans to settle and establish inclusive institutions, i.e., protection of property rights or more democratic practices in the political sphere, have developed rapidly in time, others, where settlers constructed or maintained extractive policies and institutions (i.e., slavery,

forced labor, or laws that secure political and property rights of a small elite only) fail to record such performance.

Besides these papers that point out the direct impact of institutions on economic performance, several studies probe for whether institutions affect the economic development process indirectly by other mechanisms, i.e., influencing investments, productivity level, or accumulation of human and physical capital. Among others, Knack and Keefer (1995: 220-223), Mauro (1995: 695-700), Rodrik et al. (2004: 146-147), Scully (1988: 658-662), and Tebaldi and Elmslie (2013: 890-898) show that a better institutional framework in the economic and political realm is generally associated with higher levels of investment, human capital, physical capital, innovation, efficiency, and total factor productivity. By using the relative ratio of people with high school education as a proxy for a country's structural institutions, Dias and Tebaldi (2012: 307-311) demonstrate that countries with better structural institutions grow faster than others. Their results show that apart from their direct impacts on economic growth, better institutions support the development process indirectly through increasing the respective influences of human and physical capital on the rate of economic growth. Similarly, Tavares and Wacziarg (2001: 1354-1372) corroborate the positive impact of democracy on human capital but report a negative relationship between physical capital accumulation and political freedom. On the other hand, Acemoglu et al. (2014: 21-22) find that democratization of the political sphere (1) brings along increases in the levels of investment, schooling, and public goods provision; (2) supports economic reforms; and (3) mollifies social unrest –which together set the stage for a successful long-run development performance for a country. In addition to these studies, Drury et al. (2006: 129-133) and Leblang (1996: 18-20) respectively present supportive evidence for the view that democracy fosters economic growth indirectly via lowering corruption levels and ensuring the protection of property rights.

Quite contrarily, some of the previous studies report dissenting results regarding the direct relationship between institutional structure (especially those in the political sphere) and economic performance. For instance, Decker and Lim (2008: 708-721), De Haan and Siemann (1995: 188-190), Dias and Tebaldi (2012: 307-311), and Tavares and Wacziarg (2001: 1354-1372) find that the empirical

support for the envisaged positive association between freer political environments and economic performance is generally weak or non-existent. Moreover, De Haan and Siermann (1995: 183-186) show that these results are not exceptions; instead, the non-uniform and fragile relationship between economic growth and democracy is an empirical regularity in the literature. However, Acemoglu et al. (2014: 1-6) state that such results mostly appear due to estimation problems such as model specification errors (i.e., omitted variable), endogeneity problems, and measurement errors embodied in the various political indices/variables. They show that once these errors are controlled for, empirical evidence bears out the idea that the democratization process accelerates economic progress. According to their estimations, being a democracy can increase a country's GDP per capita level by 15-35% in 30 years, depending on the specification and the variable employed (Acemoglu et al., 2014: 8-21). Parallel to these findings, Rodrik and Wacziarg (2005: 51-55) report that regime changes in the direction of democracy do not cause any growth disasters. Instead, the democratization of the political sphere generally brings about higher growth rates with lower volatility in the short run. Accordingly, they conclude that empirical evidence does not support the view that democratic transitions are detrimental to economic progress.

Overall, the bulk of evidence provided in the literature seems to be compatible with the theoretical predictions of the institutional approach. As summarized in the preceding lines, there is a consensus among scholars on the view that high-quality institutions, especially those related to property rights, promote economic progress, either directly or indirectly. In particular, however, the impact of democracy on economic performance is found somewhat less robust compared to that of property rights, although several studies point to a positive association between democratization and economic performance. Nevertheless, it is hard to state that previous works provide all the necessary answers regarding the association between institutions and economic development. Some aspects of the relationship are still open to discussion. As an example, consider the transmission mechanisms of the influence of institutions. Although several studies have examined this issue, the channels through which institutions exert their influence on economic performance are still a black box. Besides this, due to lack of conclusive empirical evidence,

previous studies have not yet provided a satisfying answer to the question of which type of institutions (political or economic institutions, or if economic ones, for example, which type of them) are more conducive to economic progress. For these reasons, the role of institutions in the economic development process of nations is still a disputable issue that requires further research to provide a better understanding of the functioning of the institutional mechanisms.

In the development literature, one popular alternative to the institutional approach is the so-called geography hypothesis, which ascribes variations in economic performance to geographic factors. Briefly, the main suggestion of this view is that geographic features such as climate, natural endowments, location, endemic diseases, and ecological conditions are the key determinants of cross-country differences in productivity and economic development (Diamond, 2004: 93-103; Easterly and Levine, 2003: 5-8; Gallup et al., 1998: 4-25; Gallup and Sachs, 2000a: 731-736; Gallup and Sachs, 2000b: 1-2; Landes, 1990: 2; Sachs, 2001: 1-3; Sachs and Warner, 1995: 1-7; Sokoloff and Engerman, 2000: 220-230). As being one of the main contributors to the geography hypothesis, Diamond (2004: 471-498) argued that much of the existing economic inequality in the modern world stems from the long-lasting influence of differences in geographic characteristics of continents at around 11,000 BC. According to him, at the end of the last Ice Age, geographically favored regions of the world, namely several parts of Eurasia continent such as Mesopotamia or East Asia, where there were plenty of plant and animal species appropriate to domestication, and climatic conditions were suitable to support human life, have provided their inhabitants an early advantage in food production. Due to this early edge, societies living in these territories have become more populous over time than any other region around the world. More importantly, the increased human population together with the advantage of domestication of wild animals and plants conduce to the appearance of earliest examples of settled life within these regions, which, by stimulating productivity and specialization afterward, laid the groundwork for the emergence of massive differences in the economic, social, and political organizations across human communities. As an example, Diamond (2004) pointed out that people living in the Eurasian continent have developed sophisticated and stratified societies that have better technologies,

advanced political organizations, and superior weapons, whereas inhabitants of other continents such as the Americas or Oceania have lived in sparsely populated communities with a primitive level of technology and social development. Hence, rather than being colonized by others, European nations are the ones that began to colonize societies living in other regions at the end of the 15th century (Diamond, 2004: 93-103, 121-147).

According to this view, the distinguishing characteristics of European forces at the time of colonization, namely advanced technologies, complex social structure, germs, and superior weapons, do not stem from their cultural or racial superiorities but are consequences of differences in initial geographic endowments across regions. Eurasian societies, which enjoyed moderate climatic conditions, high agricultural productivity, domesticated animals, and rapid diffusion of technological inventions and ideas due to the east-west direction of the continent, outdistanced the residents of other regions, and have become the winners of the development race (Gallup et al., 1998: 14-15, 51-52; Sachs, 2001: 2-3). In this respect, this line of geography hypothesis claims that the observed differences in world income distribution today are strictly tied to historical development gaps across regions originating from geographic factors (Diamond, 2004: 336-338; Easterly and Levine, 2003: 7-8).

Besides this path dependency approach proposed by Diamond (2004), there are several other geography-based views that highlight different factors such as proximity to trade/economic centers, or being a landlocked or an island, or having a particular type of mineral resources –i.e., coal, iron, gold, etc., which can support industrialization process– as ultimate sources of cross-country differences in living standards (Easterly and Levine, 2003: 5-8, 11; Frankel and Romer, 1999: 381-395; Gallup et al., 1998: 4-23; Rodrik et al., 2004: 132-133; Sachs, 2001: 1-3, 18-19; Sachs and Warner, 1995: 3). According to these approaches, countries that are located on lands proximate to economic centers, or those having coastal areas or abundant natural resources are expected to develop more rapidly than others over time, as such geographic factors lower production and transportation costs, increase benefits of economies of scale, and fosters the development of the certain type of technologies, which enable societies to produce and trade more agricultural and

industrial products (Sachs, 2001: 2-3; Sachs and Warner, 1995: 3; Gallup et al., 1998: 4-23).

Briefly, the distinctive characteristic of these views lies in their ability to incorporate time-dimension into geography hypothesis. Unlike the historical determinism approach followed by Diamond (2004), these views indicate that having a geographical advantage is a matter of time and technology: without certain types of technologies or abilities, having a coastal area or a coal reserve, or being located on a neighborhood of a rich region cannot foster society's economic progress automatically (Gallup et al., 1998: 15-16). Countries can leap forward only if they have the ability to exploit their geographic advantages –a condition, which can change in time due to the emergence of new technologies. For instance, an agricultural society, which is at its early stages of development with primitive technologies, would not be likely to benefit from its abundant coal reserves, unless it enters into the industrialization process. Or, being proximate to an economic center cannot stimulate production and trade by itself if the society suffers from a lack of capacity to absorb new ideas and technologies granted by low transportation costs of a geographic location. By taking into consideration these connections between technology and geography, this form of geography approach claims that cross-country income gaps had begun to widen with discoveries of new technologies and ideas when these geographical advantages turned into economic advantages and then started to make a significant contribution to the economic progress of countries located on productive soils (Gallup et al., 1998: 15-16; Sachs, 2001: 2-3). Therefore, in contrast to the deterministic geography hypothesis that attributes regional differences in prosperity to prehistoric differences in the geographical distribution of advantageous factors for agricultural productivity, this version of geography-based theories assert that divergence of income levels across nations is a recent phenomenon that has emanated from the interaction of certain type of geographic endowments with industrialization process starting in the late 18th century (Acemoglu et al., 2002: 1260-1261; Gallup et al., 1998: 15-16; Sachs, 2001: 2-3, 18-19).

Lastly, some authors indicate that rather than having a direct impact on economic development and productivity, the distribution of initial geographic factors

affects economic progress indirectly via shaping the initial structure of some key variables such as economic conditions or institutional structures. Sokoloff and Engerman (2000: 220-230) proposed that much of the economic disparities observed in the Americas today hinge upon regional differences in geographic endowments that shape the policies and institutional structures developed by European settler states during the colonization process. They argue that contrasting conditions in soil quality, climate, and the distribution of precious metals have caused significant differences in the distribution of wealth, political power, and human capital across North and South American colonies, which subsequently seal the fate of nations founded in these regions through generating differentials in the institutional and economic framework. For example, in the Latin American and Caribbean regions, where soil type is suitable for the cultivation of lucrative commodities like sugar and coffee, colonizers set up large plantations based on slavery, and developed extractive institutions to protect their profits from lower classes. In contrast, in the North America region, where geographic conditions are not appropriate for plantation-based agriculture, settlers constitute institutions that pay regard to equality in economic, political, and social areas among the members of the society. In the course of time, these initial contrasts in settlement strategies have transformed into differences in economic performance among regions and then pave the way for the disproportionate distribution of income observed in modern times. In line with this argument, Acemoglu et al. (2001: 1370-1377), Acemoglu et al. (2002: 1263-1271), and Easterly and Levine (2003: 3-6) state that current institutional differences between a group of countries in Africa (e.g., Congo, Burundi, etc.) and Latin America and the Caribbean (e.g., Bolivia or Brazil), on the one hand, and some of the developed countries today, e.g., the U.S., Canada, Australia, and New Zealand, on the other, are simply the results of variations in factors such as disease environment, resource endowment, and level of prosperity and population density at the time of colonization, which prompted Europeans to follow divergent settlement strategies later on. Nevertheless, these studies as well as some others, e.g., Rodrik et al. (2004: 137-153), assert that once the institutional factors are regarded, geographical differences, per se, do not have any significant impacts on the development process. Instead, they note that geographic endowments have affected

economic performance only via shaping the early forms of institutions in the political and economic spheres, which afterward, gave rise to the remarkable contrasts in the institutional and economic development paths of nations over time (Acemoglu et al., 2001: 1370; Easterly and Levine, 2003: 31-33; Rodrik et al., 2004: 135-136).

In sum, albeit there are certain differences among them, these views do not change the core idea behind the geography hypothesis: the economic success of societies lies in the fact that whether they are living in a geographically advantageous region or not. Accordingly, it is safe to state that all of the geography-based theories suggest, at least, a non-negligible empirical relationship between economic performance and geographic conditions, although the extent, way, and direction of this nexus varies with the argument provided by the particular hypothesis.

From a theoretical point of view, however, aforesaid explanations of the geography hypothesis are open to criticism on several grounds. First, as even Jeffrey Sachs, one of the most famous proponents of the geography hypothesis, mentioned, countries with the same geographical features (e.g., latitude) have significantly different institutional structures and development levels (Sachs, 2001: 4, footnote 2). For instance, he noted that the 45-degrees North latitude band passes through several countries, including the U.S., France, China, and Uzbekistan. As anyone can readily realize, these countries differ from each other not only economically but also in almost every aspect of the social organization¹⁹. Accordingly, it would be, at best, a skimpy approach to consider only latitude or another common geographical feature as an ultimate cause of the observed variations among these countries.

The second potential problem regarding the geography hypothesis is that several versions of this approach have an inherent tendency to neglect the time dimension of the economic changes. As noted in section two, the economic performance of a particular region or a country can show substantial variations over time. However, the explanations based on the geography hypothesis usually fail to predict such changes since most of the geographic variables, as their nature implies, are not really *variables* in the sense that they tend to remain fixed for long periods of

¹⁹ For the above-stated countries, the estimated level of GDP per capita in 2014 (measured as the ratio of real GDP to total population) is respectively equal to \$52,292 (the U.S.), \$39,374 (France), \$12,473 (China), and \$8,195 (Uzbekistan).

time. Therefore, it can be an inadequate approach to rely heavily on the geography hypothesis to examine the economic performance of a region/country over time.

In empirical studies, the theoretical predictions of the geography hypothesis together with the raised concerns about it have been examined in detail. On the positive side, several papers have confirmed that geographical attributes such as latitude, disease environment, natural endowments, climate, soil type, coastal access, and location are correlated with economic performances (Easterly and Levine, 2003: 23-26; Gallup et al., 1998: 30-46; Gallup and Sachs, 2000a: 731-736; Gallup and Sachs, 2000b: 2-9; Rodrik et al., 2004: 138-140; Sachs, 2001: 3-27; Sachs and Warner, 1995: 8-23). In an early study, for instance, Gallup et al. (1998: 30-46) present evidence for the idea that geographical factors have a first-order effect on the economic development process. Their analyses show that countries that suffer from high transportation costs (stemming from either being located far from core trade/economic nodes, or being landlocked), high prevalence of infectious diseases such as malaria, yellow fever, etc., a poor endowment of natural resources, and unfavorable climate conditions (i.e., tropical climate) tend to have lower growth rates and income levels compared to those in regions with the ocean- or coastal access, temperate climate, and less hostile disease environments. Gallup and Sachs (2000a: 731-736) and Sachs (2001: 3-27) also stressed that the climate and soil conditions of the tropics are detrimental to economic development. The evidence presented in these studies reveals that the agricultural and labor productivity levels of countries situated in the tropical zone are significantly lower than those in the temperate regions due to the hostile ecological environment of the tropics, which hinders the development and diffusion of effective production technologies and impedes the process of human capital accumulation. Accordingly, they conclude that the major reason for the widening income gaps across various regions is nothing but the contrasting economic performance of countries stemming from the non-uniform distribution of geographical endowments. In a similar vein, Sachs and Warner (1997: 186-188), and Gallup and Sachs (2000b: 2-9) also point out the adverse impacts of extreme climatic conditions, endemic diseases, lack of coastal access, and geographical distance from trade centers on both growth rates and income levels.

In contrast to these findings, several recent studies in the literature provide evidence against different versions of the geography hypothesis. For instance, Sachs and Warner (1995: 8-23) show that the abundance of natural resources is not associated with higher growth rates but often undermines economic performance, a la Dutch Disease phenomenon, as suggested by the resource curse hypothesis. Moreover, a number of papers assert that the empirical relationship between geographical endowments and economic performance is not as robust as proposed by the proponents of the geography hypothesis. As mentioned earlier, Acemoglu et al. (2001: 1377-1396) show that the impact of geographical factors on economic outcomes becomes weaker after controlling for other key determinants of economic performance such as institutional quality. Easterly and Levine (2003: 27-33) also state that empirical evidence does not support the idea that geographical variables have a direct impact on income levels. Similarly, Rodrik et al. (2004: 137-153) report that, if both institutional and geographical variables together are considered in the analysis, then the size of the coefficient that captures the direct influence of geography is relatively small and negligible compared to that of institutional factors. Besides these studies, Acemoglu et al. (2002: 1244-1279) presented evidence for the contrasting economic performance of the former colonies during the last five centuries and showed that geographical factors, at best, have played a partial role in the emergence of this phenomenon. Their analyses reveal that the reversal of the economic conditions among the ex-colonies was not brought about by major changes in the endowments of geographical factors, but emerged, to a large extent, as a consequence of the stimulated “reversal” in the political and economic institutional structures. On the other hand, most of these studies noticed the existence of an institutional channel via which geographic factors exert influence on economic performance. For instance, Acemoglu et al. (2001: 1383-1395), Easterly and Levine (2003: 27-33), Rodrik et al. (2004: 141-153), and Sokoloff and Engerman (2000: 221-230) show that differences between geographical factors (e.g., disease environment, soil quality, natural endowments, etc.) which have led to the establishment of various type of institutions in different parts of the world, have laid the groundwork for the emergence of economic inequalities across nations observed in the modern era. In this respect, the main suggestion of these studies is that

alongside the direct impact of institutions, a thorough explanation of the divergence phenomenon needs to encompass the interactions between geographical factors and institutions.

In general, the findings discussed above imply that there is a well-established empirical relationship between geographical factors and the economic performance of countries. Many studies have confirmed that geographical characteristics have a non-negligible impact on the economic development process. As noted, however, the relative role of geographical factors in the shaping of the recent global income distribution is still a question of fact. Some of the previous studies highlighted that the presupposed influences of geographic variables on economic performance are highly sensitive to changes in specification or to the inclusion of other factors (e.g., institutions) into the analysis. Additively, several anecdotal counterexamples to geography hypothesis, such as neighboring countries that show contrasting economic performance or observed intra-regional variations in income levels, indicate that the geography hypothesis alone is not an adequate approach to account for the whole range of empirical patterns documented in section two. Accordingly, instead of considering geographical factors as the key determinant of the observed differences between development levels, it seems more appropriate to assign them a partial role besides institutions.

In addition to the institution and geography hypothesis, the third equally important approach in the comparative development literature is the culture/religion hypothesis. Although it consists of many different versions, the common argument of this line of thinking is that cultural or religious factors that shape customs, traditions, habits, type of social organizations, way of doing business, and code of ethics are among the fundamental sources of cross-country differences in economic performance (Barro and McCleary, 2003: 760; Blum and Dudley, 2001: 217-218; Landes, 2017; La Porta et al., 1999: 229-230; Weber, 2005).

In theory, the main contention of the culture hypothesis relies on the assumption that differences in economic behaviors deeply embedded in societies' traditional/cultural/religious attributes (Barro and McCleary, 2003: 771-772; Landes, 2017; La Porta et al., 1999: 229-230; Weber, 2005). While some societies tend to be more open to new ways of economic cooperation, new technologies, innovative

ideas, and new institutional arrangements, others approach warily to accept technological or structural changes (Landes, 2017; La Porta et al., 1999: 229-230). Moreover, some religions (i.e., Protestantism, as suggested by Max Weber) are regarded as more conducive to economic development than others due to the nature of their tenets that facilitate productive activities (Blum and Dudley, 2001: 217-218; Landes, 2017; La Porta et al., 1999: 229-230, Weber, 2005). Given these differences, the culture hypothesis asserts that societies that culturally more open to changes or that have religions supporting economic activities would perform better than those with relatively conservative traditions.

In the literature, several studies support this hypothesis. For instance, Weber (2005) ascribes the contrasting economic performance of European countries to differences in their religious practices. He supposed that the economic success of several regions of Europe on the eve of the Industrial Revolution stemmed from their distinctive social organizations that rely heavily on Protestant practices. According to him, Protestantism, which preaches being successful in the world, sets a conducive social framework for individuals to engage in activities such as producing, saving, receiving education, and trading. In contrast, Catholicism that usually drives away individuals from worldly practices and gives more weight to considerations for the afterlife hinders productive activities and slowdowns economic progress. In a recent study, Blum and Dudley (2001: 210-228) also emphasize the role of these religious differences in the formation of economic inequalities across European nations. Using a theoretical model, they show that Protestant norms, which lower the cost of coordination problems regarding economic activities between agents, promote cooperation, and thereby, provide a more propitious environment to economic progress. In order to test the empirical validity of this hypothesis, they examine the economic performance of Protestant and Catholic regions of Europe in the pre-industrial period. Their analyses covering the period 1500-1750 indicate that Northern European cities adopting Protestantism have developed more rapidly than their Southern counterparts characterized by Catholic beliefs and norms. In this respect, the researchers conclude that the main driver of the emergence of cross-regional differences in Europe is the variations in cultural factors that lead to divergent development paths. Besides these historical analyses, studies that focus on

more recent episodes also report a close link between religion/culture and economic performance. In a study for the period 1965-1995, Barro and McCleary (2003: 771-780) show that several aspects of religious traditions (i.e., church attendance or belief in hell/heaven) are associated with economic growth. Further, they demonstrate that the type of religion, such as Islam, Protestantism, Hinduism, etc., has sizable effects on a country's economic performance, although the significance level of the estimated impact varies with the specification of the model.

In contrast to these findings, however, a number of cross-country studies report a scanty and mostly unstable relationship between religious factors and economic performance. For instance, Durlauf et al. (2011: 1059-1075) assert that the results presented by Barro and McCleary (2003) are not as robust as the authors suggest. They state that a reexamination of the results of this study provides only a little support for the alleged relationship between religious factors and economic growth. Using a model averaging approach with additional control variables, they show that religious beliefs or participation do not play any major role in supporting economic growth. Several other papers corroborate this weak association between religion and economic performance as well. For instance, Acemoglu et al., (2001: 1388-1389), Acemoglu et al. (2002: 44-52), Rodrik et al. (2004: 148-149), and Easterly and Levine (2003: 22-37) reveal that once the institutional and geographical factors are taken into account, analyses do not support the idea that the type of religion has a considerable and consistent impact on countries' income levels. Analyzing micro-level data for migrants residing in the U.S., Carpentier and Litina (2018: 9-19) also state that religious factors are not correlated with economic outcomes when analyses consider the impact of other control variables such as social capital, literacy, and personal traits.

Apart from these, some studies argue that a possible channel through which culture can affect economic outcomes is the influence of the cultural legacy of colonial experiences (Easterly and Levine, 2003: 22; Landes, 2017; La Porta et al., 1999: 264-265). It is hypothesized that the rules, norms, and traditions that Europeans imposed to organize economic and social activities in colonies have then remained as a basic cultural guide for locals to arrange social interactions in the aftermath of the colonial period. Therefore, the identity of the colonizer and the set

of cultural norms that it brings along are thought as a possible explanation for the contrasting economic performance among ex-colonies. In theory, it is argued that compared to the French practices, British laws and traditions are more favorable to carry out economic activities (Easterly and Levine, 2003: 22; La Porta et al., 1998: 1126-1152; La Porta et al., 1999: 231-233). Accordingly, colonies surrounded by British culture are expected to outperform others in the period following the independence. But, quite contrary to these expectations, empirical support for this version of the culture hypothesis is relatively weak. A number of recent studies show that the relationship between the identity of the colonizer and economic performance does not follow a clear pattern. For instance, Acemoglu et al. (2001: 1388-1389) and Acemoglu et al. (2002: 44-52) report that countries' income levels today are not significantly related to the nationality of the colonizer, after controlling for institutional and geographical factors. Easterly and Levine (2003: 22-37) also show that the estimated impact of having a French legal origin on income levels varies with the model under consideration, suggesting a relatively fragile relationship between colonial heritage and economic prosperity. Moreover, some studies show that there is no sign of any economic advantages of being colonized by Britain (Acemoglu et al., 2001: 1388-1389; Rodrik et al., 2004: 148-149). Parallel to these results, Sokoloff and Engerman (2000: 218-220) document large differences in income levels across British colonies and conclude that rather than the identity of the colonizer, other key factors, such as institutions and geographical endowments, have played a key role in nations' development experience.

Overall, the findings presented by previous studies do not suggest a strong relationship between cultural/religious factors and economic performance. Indeed, many studies provide a little empirical basis to follow the culture hypothesis as one of the deep determinants of economic development. It is generally found that, once the roles of institutions and geography are taken into account, cultural/religious factors have no direct and robust influence on economic performance. In addition to these results, the evidence documented in the second section seems to be quite contradictory to the main suggestions of the culture hypothesis. As the results reveal, even European countries that resemble more or less a common European culture have notable differences in their level and growth rate of per capita incomes. In

particular, the same is true for other groups of countries – such as Muslim or the East Asian countries–, which seem to share the same cultural/religious values but have demonstrated significantly different economic performance in the past five decades.

Nevertheless, these results do not mean that cultural factors are trivial to analyses regarding economic development. Instead, they only point out that the cultural hypothesis is subject to a series of empirical limitations in explaining cross-country variations in economic performance. To exemplify, consider the frequently mentioned measurement problem for cultural variables. In general, previous studies have attempted to use aggregated measures (population share of a particular group, or dummy variables) to be able to account for cultural factors. To the extent that such variables reflect the true nature of differences in cultural values across nations, relying on them can be a reasonable approach to shed light on the relationship between culture and economic development. However, it is a well-known fact that countries that seem to share the same culture or religion can have strikingly different values and traditions. In addition, it is completely normal to observe significant differences in cultural norms among regions of a country. Therefore, aggregated measures of cultural factors cannot be considered reliable in the sense that they might be subject to serious measurement errors. Besides this, many cultural values are not very suitable for quantification due to their subjective nature. Indeed, it is hard to observe and classify each of the critical variations in cultural/religious traditions across regions/countries. For that reason, cultural variables employed in the literature are mostly regarded as poor proxies for the real differences between social norms. Lastly, parallel to many geographical features, cultural values and norms do not show sharp fluctuations over time. Most of the time, it takes decades or centuries to observe significant changes in cultural traditions. As a matter of course, the culture hypothesis usually fails to provide a satisfactory explanation for the ever-changing performance of a particular economy over time.

In sum, albeit it offers a reasonable framework to examine cross-country differences in economic performance, the culture hypothesis does not seem to be compatible with a large fraction of empirical patterns observed in history. Similar to the geography view, culture-based explanations suffer from several theoretical and empirical problems documented above. More importantly, it does add only a little to

the understanding of cross-country variations in income levels due to the weak empirical support provided in the literature. On that basis, it is difficult to argue that the culture/religion hypothesis provides a better explanation than that of the institutional hypothesis, which seems to apply to a wider range of observed global patterns of income and inequality.

1.4. CONCLUDING REMARKS

In this chapter, two of the most debated subjects in economics, namely the global economic inequality and its main determinants, have been scrutinized in turn. In the first half of the chapter, the main attention is paid to the analysis of cross-country differences in economic performance. The evidence presented in section two suggests that global income distribution has been characterized by high and persistent inequalities over the past five decades. There are both regional and inter-regional differences in the level and growth rate of per capita incomes. Moreover, the results imply that such differences have tended to continue until recently, in part due to the poor economic performance shown by most of the low-income countries.

In the second half of the chapter, the main focus is shifted towards the arguments provided by previous studies as explanations for such patterns. In the third section, three of the prominent views on economic development, namely institutions, geography, and culture, are discussed in a comparable manner. In sum, the main conclusion reached in this review is that the institutional approach is far better than other alternatives to comprehend differences in economic performance across countries. As discussed above, this is for several reasons. First, the institutional view has a number of theoretical advantages over culture- or geography-based views. For instance, due to their ever-changing characters, institutional variables, at least in theory, make it possible to explain performance differentials stemming from variations across time –which is quite unlikely for most geographical and cultural factors as they usually show little or no change over time. In this respect, the institutions hypothesis seems to provide a better explanation than that of the other competing theories for the occurrence of income reversals or of performance changes in a region/country over time. Second, as mentioned on several occasions, history is

replete with examples of the divergent economic performance of countries located in the same region or that have similar cultural/religious heritage. Given the fact that the culture and geography hypothesis, respectively, attributes cross-national performance differentials to variations in cultural and geographical factors, these approaches provide hardly any theoretical basis to reveal the underlying factors that lead to such contrasts. On the other hand, since the institutions hypothesis allows for variations in institutional structures among countries with similar cultural or geographical characteristics, it is not subject to the aforementioned shortcomings of these approaches. Therefore, in part due to this flexible and comprehensive framework that it offers, the institutional theory appears as the best alternative to examine a substantial portion of observed differences in the process of economic development, including some of the well-known examples of contrasting experiences such as the one regarding South Korea and North Korea.

However, although it provides useful arguments, the institutional approach as well is still far from giving a complete picture of the changing nature of the global income distribution. Indeed, there are several critical issues regarding both the theoretical and empirical suggestions of this hypothesis that deserves a sharper focus. For instance, as discussed in the third section, previous literature has not yet reached a consensus on the type or set of institutions that promote economic development, or, on the mechanisms via which institutions influence economic outcomes. Moreover, up until recently, most of the studies regarding the relationship between institutional factors and economic performance do not follow a theoretical approach to signify interaction channels or to form a basis for the empirical analysis. For that reason, it is hard to consider such studies as elucidatory since they have deficiencies in expressing explicitly all the assumptions, hypotheses, and mechanisms that connect institutions to economic performance. Nevertheless, the problems mentioned above do not attenuate the importance of the presumed links between institutions and economic performance. In contrast, they imply that it is still worth studying both theoretical and empirical aspects of the institutions-development nexus. With these facts in mind, the following two chapters, using these issues as a source of motivation, are devoted to examining both the theoretical and empirical dimensions of the relationship between institutional factors and economic performance.

CHAPTER TWO

INSTITUTIONS AND ECONOMIC PERFORMANCE: THEORETICAL FRAMEWORK

2.1. INTRODUCTION

In the last fifty years, world income distribution has not changed in the direction predicted by the convergence hypothesis. As chapter one reveals, the existing gaps between rich and poor regions of the world have widened rather than narrowed over time. More importantly, analyses show that income disparities across nations have not only ascended in absolute terms but also in relative terms, suggesting that many of the laggard countries have failed to record high growth rates presumed by the neoclassical models.

In the literature, several other studies also noted the above-mentioned discordance between historical changes in the global income distribution and the convergence hypothesis. For instance, examining the economic performance of a large set of countries over the period 1870-1990, Pritchett (1997: 9-14) found that global inequality has been rising steadily since the late 19th century. His estimations based on several inequality measures indicate that existing income gaps between developed and developing countries have widened in time due to the relatively weak economic performance of the vast majority of backward countries. Moreover, he argued that the convergence hypothesis only applies to a small group of now-rich nations. When the analysis covers the growth experience of all countries, the evidence does not support the idea that cross-country differences in income levels have declined over time. Similarly, De Long (1988: 1139-1148) stated that there is no compelling evidence for the existence of income convergence even among the rich countries. Results reported in the study reveal that nations that were relatively rich in 1870 have either maintained or solidified their exclusive positions afterward, implying that there is no natural tendency for backward countries to grow faster than the leading ones and achieve income levels as high as in those wealthy nations.

Since the mid-1950s, economists have developed several theories examining the underlying causes of the divergence among the countries of the world. In one of

these early attempts, Robert Solow proposed a growth model that emphasizes the roles of physical capital accumulation and technological progress in an economy's long-run development path (Solow, 1956 and 1957). Briefly, the Solow growth model reveals that a country's steady-state income level is determined by several exogenous factors, including the savings rate, population growth rate, the initial level of productivity, and the growth rate of technology (Solow, 1956: 66-91). Hence, the model implies that nations with similar characteristics in terms of these factors would end up with the same level of output in the long run. Besides this, Solow assumed that there are diminishing returns to capital formation, suggesting that an economy starting with a low level of capital would grow faster than others (Solow, 1956: 70-71). However, given the fact that steady-state income level is a function of a number of factors mentioned above, this assumption intimates that convergence in income levels would occur only if countries have the same steady-state output level. Otherwise, the model put forth that there is no theoretical reason to expect convergence among countries with quite different characteristics and steady-state income levels.

Up until now, some studies noted that there are significant differences between theoretical predictions of the Solow model and the observed economic performance of countries. For instance, Mankiw et al. (1992: 407-416) argued that the relative income gaps between rich and poor countries are much more pronounced than the one suggested by the model. Moreover, several others implied that because of its plain structure, the Solow model could only provide little guidance to elucidate cross-country variations in growth rates. Phelps (1961: 638-643) and Yeldan (2009: 132-138) pointed out the fact that the model ascribes much of the difference in economic performance to differences in exogenous factors (such as the savings rate or the level of technology) for which it provides no further explanations. Thus, these studies indicated that the original Solow model is quite incomplete and needs to be modified in several ways.

Building on the discussions above, some economists have reconsidered the theoretical basis of the Solow model and proposed various changes to account for the absence of convergence among nations. For instance, Mankiw et al. (1992: 424-429) state that an augmented version of the Solow model that incorporates the

accumulation of human capital alongside the physical capital is compatible with the observed changes in the global income distribution. They show that, once the physical and human capital, technical progress, and the population dynamics are controlled for, evidence supports the conditional convergence hypothesis (Mankiw et al., 1992: 424-429).

Quite differently, a number of studies in the literature have laid out theoretical models suggesting that income gaps between rich and poor countries might persist over time. The models developed by Romer (1990), Lucas (1988), and Barro (1990), among others, reveal that the long-run economic performance is dependent on endogenous changes in several factors, including human capital, technology, and government expenditures, which could alter the productive capacity of an economy in a continuous manner. Accordingly, these models suppose that countries initially endowed more resources to invest in research and development activities, education facilities, or public services would consistently record higher growth rates than those with limited capacity to make such investments. This means that if growth process has an endogenous character, advanced countries that have more income to support productive activities would grow at least as fast as developing countries. For that reason, this class of models foresees that, contrary to the predictions of the Solow model, existing productivity gaps between nations would not narrow but continue or even widen over time.

From a theoretical point of view, it is hard to overlook the importance of the aforesaid models for the field of growth and development economics. Each of these models has made significant contributions to the understanding of the theoretical underpinnings of the long-run growth performance of economies. Indeed, by identifying several variables and mechanisms that influence economic development, they have provided new insights into the cross-country differences in living standards. However, despite all their efforts, these models are still far from providing a comprehensive explanation for the growth process. As discussed above, most of these models assert that sustained growth occurs only when there is a continuous factor accumulation or technological improvement. Therefore, they generally attribute cross-country variations in economic performance to differences in the levels or growth rates of human capital, physical capital, technology, and

productivity. But, none of these models shed light on the deep determinants of the existing or emergent differences in the noted factors, such as institutions or market incentives. This is true even for the class of endogenous models developed lately. For instance, Romer (1990) pointed out the critical role of property rights institutions and patent regulations in the process of invention and technological progress but did not explicitly model how such institutions emerge and interact with economic variables. Instead, he focused directly on how technological progress can be sustained continuously within a given market structure and accompanying institutional arrangements. Similarly, Dias and Tebaldi (2012) proposed a growth model showing how the quality of institutions can affect the accumulation of human capital and economic growth. But, as Romer (1990) did, they treated institutional structure as an exogenous parameter of the model rather than suggesting a mechanism that explains its evolution. On the other hand, Barro (1990) developed an endogenous growth model in which productive government spending, such as infrastructure expenditures, helps overcome diminishing returns to capital and leads to a growth process that constantly reproduces itself. Although this study mentioned the role of government in securing property rights and providing regulatory and legislative arrangements, it leaves unanswered the question of how the government can perform such activities. Moreover, the model proposed in the study suggested that improvements in the quality of institutions could be treated as negative taxes on productive activities. However, given the complex nature of institutional factors and their association with economic variables, such an approach is quite negligent and thus cannot be regarded as an appropriate way to model institutions.

Another important point worth mentioning is that these endogenous models, along with the earlier neoclassical models, rely mainly on the assumption that the economy is operating in a frictionless environment, in which agents can engage in productive activities without encountering any information or transaction costs or without considering any fear of seizure by force. That is, they implicitly assume that property rights are well defined and economic activities are costless. However, it is a well-known fact that, in the actual world, property rights are far from being perfectly defined, and economic transactions are generally subject to a substantial amount of cost stemming from uncertainties, information asymmetries, unequal distribution of

bargaining power, and monitoring and enforcement problems (North, 1991: 98-102). Thus, ignoring such frictions and costs embedded in the process of economic interactions, these models tend to overlook some of the critical aspects of the economic environment. In this respect, none of the models mentioned above can be considered as ultimate portraits of the true nature of the economic development process.

As discussed in detail in the first chapter, several studies in the literature have suggested that institutional structures, which define the general rules of the economic and political environment, have significant impacts on economic outcomes. For instance, North (1991: 97) states that, by determining the level of information and transaction costs, institutions exert a direct influence on the feasibility and lucrateness of the exchange process. For that reason, he supposes that there is an inherent dependency between institutional structures and economic performance: while institutions that enable low-cost transactions would promote economic performance, others that fail to lower the cost of doing business would retard the development process (North, 1991: 97-98). Supportively, Acemoglu and Robinson (2013: 73-83) assert that institutions, which constitute the incentive mechanisms in the economic and political sphere, play a substantial role in allocating resources and thereby determining the productive capacity of nations. According to them, institutional differences that offer nonidentical incentives for economic agents living in different countries are the root causes of the emergence of cross-national disparities in factor accumulation or technological progress. In countries where there are inclusive institutions, such as secured property rights, democratic political processes, and effective legal systems, individuals and firms would be wishful in making new investments or engaging in research and development activities that support technological progress. Quite the contrary, in countries deprived of such institutions, there would be little incentive for agents to design and undertake activities that foster the productive capacity of the economy. For that reason, they suppose that such nations would ultimately fall behind the others succeed in forming a secure and sustainable economic environment conducive to economic growth.

In short, the institutions hypothesis developed by these studies indicates that institutional structures matter for the economic fate of nations: What primarily

determines the difference between prosperity and poverty is the institutional quality. Indeed, given the fact that transaction costs and incentive mechanisms are influential over the type and profitability of actions taken by individuals, the hypothesis implies that institutions and institutional changes are among the main determinants of the economic performance. On that note, the main suggestion of this approach is that a theoretical model that aims to explain the growth and development process of nations should consider, all above else, the mechanisms of interaction between institutional factors and economic variables.

Parallel to these discussions, the rest of the chapter is devised to introduce theoretical models that incorporate institutional factors into the analysis of economic growth. Each model presented in the following lines put emphasis on different aspects of the relationships between institutions, economic growth, and development. For instance, the first model, which offers a small but significant improvement in the basic Solow model, shows how exogenous differences in the level of institutional development can lead to notable differences in capital formation and economic prosperity across nations. By relaxing the assumption of exact equality between the investments and savings and, instead, assuming that there are transaction/information costs in the economy, the model reveals that high-quality institutions that lower frictions in the capital markets would foster both capital accumulation and economic progress. In this respect, the proposed model provides a partial explanation for the lack of empirical support for the convergence hypothesis. According to the results, there would be convergence only if a group of countries has the same quality of institutions alongside other conventional factors. If countries do not have similar institutions, as it is the case in the actual world, there might not be convergence but divergence in income levels. Therefore, this version of the Solow model suggests that, although they may not be the ultimate reasons, the permanent differences in the quality of institutions are among the possible factors that prevent economies from convergence.

Compared to the first, the second model presented in this section provides a more comprehensive framework that examines both the reasons and causes of the institutional development process. Following the argument that governments are the main agents responsible for establishing the relevant institutional structure in an

economy, the model suggests a theoretical framework that links economic performance to the quality of institutions developed by the government. As shown below, the model reveals that there is a positive relationship between induced institutional development and economic performance: In economies where the government allocates more of its resources for developing effective institutions, the output production and thereby the steady-state income level would be higher compared to that of countries in which governments place less emphasis on institutional development. Also, the model implies that the transitional period growth rate is dependent on the quality of established institutions. According to the results, the growth rate of income increases as the quality of institutions increases, all other being equal. Therefore, this model ascribes a vital role for the government and, particularly, the institutional framework developed in an economy, in explaining cross-national variations in economic growth and prosperity. More importantly, the model also provides a theoretical basis that makes it possible to incorporate some of the frequently discussed topics in the field of political economy into the growth analysis. Why some nations have better institutions than others? Or, what drives a government to invest more or less into institutional quality?

Further, the present model demonstrates the trade-off between benefits and burdens of government expenditures, in a way similar to Barro (1990). Results show that although government spending that facilitates institutional development is a pillar of support for the production process and economic growth, it also imposes a burden on the economy through taxation. Therefore, the model lays out a framework that allows for examining dynamic interactions between crowding-out and productive effects of government involvement in an economy.

Overall, the analysis presented in this chapter serves two purposes. Firstly, by specifying some of the theoretical mechanisms of interaction between institutions and economic performance, it contributes to the debate on how institutional factors affect economic prosperity and well-being. Secondly, as the models at hand reveal some of the key determinants of institutions, factor accumulation, economic growth, and development, the analysis provides a theoretical basis for the empirical part of the thesis presented in the third chapter.

The remainder of the chapter is organized as followed. Section two presents the results and main implications of the first model that builds on the Solow growth model. Following this, section three introduces the second model that incorporates the interactions between government policies and institutional development into the growth analysis. Finally, the concluding section summarizes the main results derived from the models and closes the chapter by suggesting some policy implications.

2.2. MODEL 1: INSTITUTIONS IN A SIMPLE MODEL OF ECONOMIC GROWTH

2.2.1. Theoretical Background

As Robert Solow himself points out in the introduction part of his seminal paper, all economic theories rely on assumptions that are not very realistic (Solow, 1956: 65). In this regard, the Solow growth model is also no exception. As a close examination can easily expose, the Solow model and the main conclusions derived from it mostly depend on several assumptions that are not compatible with the functioning of real-world economies. For instance, one of the questionable premises of the model is that economies are working in a frictionless environment where transaction/information costs and institutional structures do not have any significant impacts on the process of capital accumulation and production. But, due to obvious reasons, this kind of assumption could not be considered as conceivable while describing the actual economic environment. In the real world, transaction costs and incentive mechanisms are among the main determinants of investment and production decisions (Acemoglu and Robinson, 2013: 73-83; Greif, 2006: 3-5; North, 1990: 61-69). Therefore, in a growth model that aims to reveal the true nature of economic progress, the assumption of frictionless markets or negligible transaction costs should have to be abandoned. Instead, the model economy should be reconfigured so that institutional factors could influence some of the key economic variables and the development process itself.

For the very reasons mentioned above, the current section starts with analyses reconsidering two critical assumptions of the original Solow model: the presumed

savings-investment equality and the frictionless capital markets. For each of these assumptions, the model presented below suggests some modifications that allow for examining the interactions among institutional factors, capital formation, and output production within a neoclassical framework. The rest of the section is then devoted to presenting the main implications and results of these efforts.

By and large, the Solow growth model depends on the assumption that capital accumulation takes place within a perfect market environment: total savings, the fraction of output not consumed, could be turned into new investments without any loss or difficulty (Solow, 1956: 66). Accordingly, the model assumes a smooth transmission mechanism from savings to capital investments, which overlooks the impacts of transaction and information costs on the capital accumulation process. But, as mentioned by a number of studies before, these costs are an essential part of economic activities, and together with institutional factors, they have a direct influence on decisions regarding how much to invest, save, or produce (Greif, 2006: 3-5; North, 1990: 61-69). For instance, Krueger (1974: 301-303) noted that institutional arrangements that raise the cost of doing business, or that alter the incentive structure in a way that unproductive activities become rewarding, could lead agents to shift their resources from productive activities (i.e., investing in new technologies or capital) to fruitless ones (i.e., rent-seeking or pursuit of windfall incomes). More recently, North (1991: 101) highlighted the role of institutional development in promoting economic activities and stated that the existence of high-quality institutions, such as secured private property rights or well-functioning capital markets, is the *sine qua non* for achieving sustained capital formation and economic growth in the long-run. Several others, including Acemoglu and Robinson (2013: 73-83), have raised similar arguments as well.

Overall, the studies mentioned above emphasize the fact that in contrast to the standard framework that treats institutional factors as latent or neutral, a model of economic growth should have to recognize the effects of institutions on economic decisions and outcomes. In other words, they state that along with conventional factors, institutional structures as well should be included in the growth analysis. In line with the intention of addressing this issue, several papers in the literature have, so far, suggested models that reveal the association between institutional structures

and several aspects of an economy, such as the income distribution, factor accumulation process, technological progress, and productivity. For instance, in an early study, Krueger (1974: 295-301) developed a static model suggesting that institutional arrangements that give rise to rent-seeking activities can distort the resource allocation mechanism of an economy and thus lead to substantial decreases in productivity. Lately, Emerson (2006: 195-204) also shows that institutions that provide better monitoring mechanisms can lower corrupt activities, foster competitiveness, and thereby lead to welfare gains.

Besides these static analyses, some of the previous studies proposed theoretical models that examine the dynamic impacts of institutions on productivity, capital accumulation, technological progress, and economic growth. For example, modifying several aspects of the original Solow growth model, Tebaldi and Mohan (2008: 1-7) has shown that institutional factors, which determine the rate of technical progress and the level of marginal productivity of inputs, have notable effects on both the income level and the growth rate. Similarly, by devising an endogenous model that encompasses both the micro- and macro-level relations between institutional quality and factor accumulation, Dias and Tebaldi (2012: 303-307) revealed that high-quality institutions that support the process of human capital development and physical capital formation are conducive to economic progress. As a side note, they also illustrated that improvements in the quality of institutions are associated with lower income inequality and higher productivity, which together foster economic growth further by creating positive externalities. Lastly, Acemoglu (2009: 781-860) and Alesina and Rodrik, (1994: 468-478) proposed growth models that examine how changes in political preferences that alter institutional arrangements can lead to variations in income distribution and economic growth.

In a number of ways, the model introduced in this section is different from those models mentioned above. First, unlike the static models that focus solely on the instantaneous impact of institutional structures on economic margins, resource allocation, and productivity, the present analysis introduces a *growth* model that examines the dynamic relationships between institutions, development, and economic growth. In this sense, it provides a richer framework, compared to that of

static analysis, for evaluating the long-run effects of institutional differences on economic growth and prosperity.

Second, most of the studies in the literature incorporate institutional factors or structures into analysis without establishing any formal relation between institutions and transaction costs (i.e., Alesina and Rodrik, 1994; Dias and Tebaldi, 2012; Tebaldi and Mohan, 2008). Contrary to this tradition, the model at hand proposes a framework that allows for tracing the explicit links between transaction costs, institutional factors, and several other country-specific variables, such as education or culture. Due to this novelty, the model differs positively from previous growth models and represents an improvement, albeit in a narrow scope.

Third, the endogenous growth models mentioned above were usually designed to highlight the role of micro-level decisions (i.e., profit/utility maximization) in determining the growth path of an economy. To some extent, there is no doubt that this type of modeling has significant contributions to the understanding of micro-foundations of the growth process. But, at the same time, it has brought along several problems regarding the empirics of economic growth. For instance, one common problem about these models is that they define economic growth as a function of a number of fictitious parameters, such as the subjective intertemporal discount rate (Alesina and Rodrik, 1994; Dias and Tebaldi, 2012). Given the fact that there are no good proxies for such variables, however, following this approach makes it almost impossible to construct properly designed empirical strategies to analyze the growth process. Besides this, despite their theoretical superiority, the family of endogenous growth models represents only scanty progress in terms of growth empirics. Most of the time, the micro-level behaviors considered by these models serve only to reveal the theoretical underpinnings of a particular result or an observation but do not provide much guidance to the exact way of how to carry out empirical analysis to test the implied relations.

In contrast to the endogenous models, the augmented version of the Solow model discussed below is independent of most of these issues. For example, since the proposed model is based on the Solovian structure, it mostly ignores the aforesaid micro-level analysis and considers principally the macro-level interactions between institutional arrangements and economic growth. Although one can argue that this is

not the most elegant way of incorporating institutions into the analysis, using such a heuristic approach makes it possible to draw some rough but useful results while concurrently refraining from theoretical challenges of revealing micro-level aspects of the growth process. In addition to this, the easy-to-follow structure of the model allows for avoiding over-parameterization and abstraction problems from which the endogenous growth models frequently suffer. Lastly, compared to the complicated structure of the endogenous models, the employed framework in the model provides a handy way to derive a couple of equations of prime importance, including the convergence equation, which would be later used as a basis to carry out the empirical analysis. As a result, despite its simplicity, the extended Solow growth model presented below is, on the whole, an appropriate one to work on and derive some testable implications regarding the growth and development effects of institutional structures.

2.2.2. The Model

This section introduces the first attempt at incorporating institutional factors into a growth model. As stated before, the model presented in this section is an augmented version of the Solow growth model and maintains all assumptions of the Solovian framework except the one supposing that capital markets are operating in a frictionless environment. To be more specific, the model (1) assumes that there are transaction costs in the economy, and (2) proposes that these costs have direct impacts on the savings-investment relationship in the economy.

Before identifying the role of institutional factors in the capital market in detail, it is more convenient to start with the structure of the hypothetical production technology. In the model, it is assumed that output production exhibits constant returns to scale and is characterized by the following form of the Cobb-Douglas function:

$$(1) \quad Y(t) = K(t)^\alpha [A(t)L(t)]^{1-\alpha}, \quad (0 < \alpha < 1)$$

where Y denotes output, K is the stock of physical capital, L is labor, A is the level of technology, and α is the capital elasticity of output, ranging from 0 to 1. Equation (1) indicates that an economy's output production depends on three different factors: capital stock, labor force, and technology. For simplicity, it is supposed that the labor force participation rate is fixed and equal to 1, suggesting that the total number of workers in the economy is exactly the same as the aggregate population level. Moreover, following Solow (1956), the model presumes that population and technological capacity is growing at an exogenous rate of n and x , respectively. That is,

$$(2) \quad L(t) = L(0)e^{nt},$$

$$(3) \quad A(t) = A(0)e^{xt},$$

where n is the growth rate of population or labor force and x is the rate of technological change. In the original Solow growth model, it is assumed that investment always equal savings, which is defined as a constant fraction of total output. In a closed economy, that implicitly amounts to state that capital markets are perfect and that savings can be turned into physical investments on a one-to-one basis. Unlike the Solow model, the present model presumes that there are transaction costs in the capital market, and therefore, only a fraction of total savings can be used to finance new investments. Formally,

$$(4) \quad \begin{aligned} vS(t) &= I_K(t) \Rightarrow \\ vsY &= I_K. \end{aligned} \quad (0 < v \leq 1; 0 < s < 1)$$

Here, S is total savings, I_K is the level of gross capital investments, s is the savings ratio, and v denotes the fraction of total savings transformed into investments, or simply, the conversion ratio. Equation (4) implies that gross capital investments are not only dependent on the constant savings ratio, as in the Solow case, but also on the conversion rate of savings into investments. In addition, this equation indicates that, during the process of capital formation, a portion of aggregate savings is evaporating as a result of transaction costs. That is, a certain

amount of resources are allocated to overcome existing transaction costs in the capital market. To show it explicitly,

$$(5) \quad I_T(t) = (1 - v)sY,$$

where I_T is the aggregate level of transaction costs or frictions in the market and $(1 - v)$ represents the proportion of total savings lost during the process of capital formation. Given the fact that transaction costs allow only for a partial transmission from savings to investment, the capital accumulation equation in the model is defined as follows:

$$(6) \quad \begin{aligned} \dot{K}(t) &= I_K - \delta K \Rightarrow \\ \dot{K}(t) &= vsY - \delta K \quad (0 < \delta < 1) \end{aligned}$$

where $\dot{K}$ refers to the change in capital stock and δ is the depreciation rate.

One of the critical assumptions of the present model is that the conversion rate, v , and hence the level of transaction costs, are primarily dependent on an economy's institutional structure. To put it more precisely, the model assumes that capital market efficiency is a function of the institutional quality. The equation below shows the exact form of the presumed relationship between conversion rate and institutional quality:

$$(7) \quad v = h(q, \gamma) = q^\theta \gamma^\rho. \quad (0 < q, \gamma \leq 1; 0 < \theta, \rho < 1) \\ (v_q > 0; v_\gamma > 0)$$

In equation (7), q stands for the relative development level of a country's institutional structure, γ refers to other factors that can be influential over the capital market efficiency, θ denotes the weight of institutional factors in determining the conversion rate, and ρ denotes the weight of other country-specific factors. According to (7), there is a positive relationship between institutional quality and capital market efficiency: all other things being equal, the higher a country's institutional quality index, q , the higher the conversion rate, v . Therefore, the

equation envisages that high-quality institutions that lower transaction costs would ultimately improve the transmission process and foster capital formation. Besides institutions, the above equation also suggests that other country-specific factors that might strengthen/weaken the transmission mechanism, i.e., social capital, cultural homogeneity, religious beliefs/practices, or education level, can play a role in determining the conversion rate and the level of market frictions. In this sense, this equation introduces a well-rounded explanation for the observed cross-country differences in the level of market frictions stemming from beyond institutional variations. To exemplify, (7) indicates that although two countries may have the same level of institutional quality, say ($q = 0.8$), if one country has a high level of literacy rate ($\gamma = 0.9$), and a second one has a lower level ($\gamma = 0.5$), the former would have a lower proportional share of transaction costs compared to that of the latter (respectively, 15% and 37%, assuming $\theta = \rho = 0.5$). Therefore, the model indicates that the volume of transaction costs, or reversely, the level of capital market efficiency can vary considerably across countries having similar institutions but quite different cultural or social characters.

In order to solve the model, the production function, (1), and capital accumulation function, (2), are rewritten in terms of per effective worker by respectively assuming $\hat{y} = \frac{Y}{AL}$, and $\hat{k} = \frac{K}{AL}$:

$$(8) \quad \hat{y}(t) = \hat{k}(t)^\alpha,$$

$$(9) \quad \dot{\hat{k}}(t) = \nu s \hat{y}(t) - (x + n + \delta) \hat{k}(t).$$

Then, (7) and (8) are inserted in (9) to obtain the modified version of the so-called fundamental Solow equation of motion:

$$(10) \quad \dot{\hat{k}} = q^\theta \gamma^\rho s \hat{k}^\alpha - (x + n + \delta) \hat{k}.$$

Equation (10) implies that capital per unit of effective worker increases as the quality of institutions increases. Conversely, it shows that higher rates of effective depreciation lower the level of capital accumulation. By definition, when the

economy is at the steady state equilibrium, capital per effective labor would be constant. That is, $\dot{\hat{k}} = 0$ at the steady state. Consequently, putting this information into (10), and then solving for $\hat{k}$, gives the following expression that defines the steady-state level of capital stock:

$$(11) \quad \hat{k}^* = \left(\frac{sq^\theta \gamma^\rho}{x+n+\delta} \right)^{1/(1-\alpha)},$$

where $\hat{k}^*$ denotes the equilibrium level of capital per effective worker. Since $\hat{y} = \hat{k}^\alpha$, the equilibrium level of output per effective worker, $\hat{y}^*$, would be then equal to:

$$(12) \quad \hat{y}^* = \left(\frac{sq^\theta \gamma^\rho}{x+n+\delta} \right)^{\alpha/(1-\alpha)}.$$

The last two equations summarize the key results of the institutions-augmented Solow model. First, in line with the findings of Solow (1956), equation (11) and (12) suggest that, while savings ratio, s , is positively related to the steady-state levels of capital and output, the effective depreciation rate, $(x + n + \delta)$, affects equilibrium levels negatively. Second, these equations show that institutional factors have direct impacts on an economy's capital accumulation process and production capacity. As the results reveal, the steady-state levels of capital stock and output are positively associated with the institutional quality index, suggesting that high-quality institutions are conducive to capital formation and production in the long run. In particular, equation (11) and (12) provide a partial explanation for the lack of empirical support for the convergence hypothesis. These equations show that, unlike the traditional Solow model, the steady-state level of capital stock or output can vary substantially across countries as a result of institutional differences. For instance, (12) implies that countries having similar characteristics in terms of savings, population dynamics, or technological progress would achieve quite different output levels when they have dissimilar institutional frameworks. That means, even among a group of homogenous countries having the same Solovian properties, existing variations in the quality of institutional structures could lead to notable and persistent differences in income levels. To put it in another way, the above equations suggest

that backwardness might be long-lasting due to underdeveloped institutions. Results imply that, despite all their efforts, backward countries would not be able to catch up with developed nations if they have relatively low-quality institutions or show little progress in terms of improving their institutional framework. As a consequence, the present model considers institutional quality, a factor totally overlooked by the Solow growth model, as one of the main drivers of capital formation and economic development. Additively, it also suggests that at least a portion of observed income gaps between nations is due to institutional differences.

Lastly, both (11) and (12) point to the role of other country-specific factors alongside institutions and traditional Solovian variables in the long-run development process. Results show that countries having “positive” characteristics (i.e., a peaceful environment or low level of cultural conflict) would achieve a higher level of steady-state output (capital) per effective worker compared to those having reverse characteristics. This means that cross-country differences in income levels do not reflect only disparities in savings ratios, population growth rates, or quality of institutions but also do reflect variations in cultural practices or social structures.

Regarding all these theoretical implications, it is safe to state that the model developed in this section provides a more flexible and illuminating framework than the original Solow model to explain cross-national differences in economic prosperity. In fact, equations (11) and (12) show that the original Solow model is just a specific variant of the present model, referring to a case,

$$(13) \quad q^\theta \gamma^\rho = v = 1.$$

As (13) states, the Solow model assumes that the conversion rate or the degree of capital market efficiency is constant and determined independently from institutions or other structural factors. Compared to the above results covering a wide variety of possibilities and cases in the capital market, the situation mentioned in (13) is highly restrictive in the sense that it almost completely neglects the role of several instrumental factors, including institutions. Therefore, instead of following the conventional framework, employing the model developed here seems to be a more

appropriate way to analyze the various dynamics of capital accumulation and production.

Before passing to convergence implications of the model, note that (11) and (12), respectively, defines capital stock and output in terms of *per effective unit of labor*. As generally known, however, these two variables have neither interpretable meanings nor reliable measures. Thus, to be able to study with observable and economically meaningful variables, (11) and (12) are converted into *per capita levels*. To do that, both sides of these equations are multiplied by the technology index, $A(t)$, which yield the following equations:

$$(14) \quad k^*(t) = A(t) \left(\frac{sq^\theta \gamma^\rho}{x+n+\delta} \right)^{1/(1-\alpha)},$$

$$(15) \quad y^*(t) = A(t) \left(\frac{sq^\theta \gamma^\rho}{x+n+\delta} \right)^{\alpha/(1-\alpha)},$$

where $k^* = \frac{K}{L}$ and $y^* = \frac{Y}{L}$, respectively. Equations (14) and (15) elementarily reveal the theoretical determinants of per capita capital stock and output in the long run. Hence, they represent the key equations of the model, which shed light on the nature and causes of why some nations are rich and others poor. For instance, equation (15) shows that a country's per capita income level is determined by a number of exogenous factors considered in the model. As the equation suggests, economic prosperity is positively associated with high-quality institutions, high savings ratios, better technologies, and positive social characteristics, but is negatively related to population growth. In this respect, (15) implies that, besides traditional Solovian variables, economic success of nations depends on institutional structure. That is, when all other things being equal, what really engenders cross-country variations in income levels is the relative difference in the quality of institutions.

Lastly, taking the natural logarithm of both sides of (15) would yield a testable equation that can be used as a baseline for the empirical analysis:

$$(16) \quad \ln y^*(t) = \ln A(0) + xt + \left(\frac{\alpha}{1-\alpha} \right) \ln s + \left(\frac{\alpha\theta}{1-\alpha} \right) \ln q + \left(\frac{\alpha\rho}{1-\alpha} \right) \ln \gamma \\ - \left(\frac{\alpha}{1-\alpha} \right) \ln(x + n + \delta).$$

At a given point in time, if one assumes a stochastic process, (16) can be rewritten in the following regression form:

$$(17) \quad \ln y^* = a + b_1 \ln s + b_2 \ln q + b_3 \ln \gamma + b_4 \ln(x + n + \delta) + \epsilon,$$

where $a = \ln A(0)$, b_i stands for the corresponding coefficient on each variable, and ϵ represents the error term that takes into account the other country-specific factors neglected by the model. The expressions appearing in (16) and (17) are the derived regression equations that summarize all the theoretical implications of the institutions-augmented Solow growth model. As one can easily notice, the equation (16) reveals both the direction and magnitudes of interactions between income and other key variables of interest, including institutions. In this respect, it provides a useful and straightforward way to test the empirical validity of the implied relationships between variables of the model and per capita income, once the appropriate proxies exist.

So far, the analysis has demonstrated only the *level* effects of institutions, i.e., the impact of institutional quality on per capita income or capital stock, but has not said much on the relationship between economic growth and institutional structure. As a general rule in the literature, the growth effect of a particular variable can be analyzed in two different ways within the framework of the Solow model: (1) considering the long run behavior of the model and (2) examining transition period dynamics. To evaluate first the long-run effects, remember that the present model relies on the assumption that capital per effective worker, $\hat{k}$, is constant ($\dot{\hat{k}} = 0$) when the economy is at the steady-state point. Since the capital-output ratio is assumed to be fixed in the long run, this implies $\dot{\hat{y}} = 0$ as well. Accordingly, the model suggests that per capita output (or capital) grows exactly at the rate of technical change, x . This outcome can be verified easily from either (14) or (15). For instance, by taking logs of (15) and then differentiating with respect to time, one can show that

$$(18) \quad \frac{\dot{y}}{y} = \frac{\dot{A}}{A} = x.$$

In a word, the above equation states that, in the long run, per capita output growth depends solely on technological progress, as it is the case in the original Solow model. Thus, it implies that institutions have no direct impact on an economy's balanced growth rate. In other words, the model shows that institutions determine only the per capita income level but not the long-run growth rate of an economy. However, this result does not mean that institutions are of no significance in the growth process. Quite the contrary, this augmented version of the Solow model suggests that, by determining the long-run production capacity, institutions can exert influence on economic growth during the transitional period. Further, as the below derivations illustrate, the model indicates that institutional development should be regarded as one of the main factors that governs the process of income convergence across countries.

To show these implications explicitly, consider first the intensive form of production function, (8). Writing equation (8) in a growth form and then substituting into $\dot{\hat{k}}$ from (10) produces:

$$(19) \quad \frac{d}{dt}(\ln \hat{y}) = \alpha[sq^\theta \gamma^\rho s \hat{k}^{\alpha-1} - (x + n + \delta)].$$

In order to express the output growth as a function of $\ln \hat{k}$, this equation can be rewritten as

$$(20) \quad \frac{d}{dt}(\ln \hat{y}) = \phi(\ln \hat{k}) = \alpha[sq^\theta \gamma^\rho e^{(\alpha-1)\ln \hat{k}} - (x + n + \delta)].$$

At around the steady-state, applying a one dimensional first-order Taylor approximation to (20) would lead to:

$$(21) \quad \frac{d}{dt}(\ln \hat{y}) = -\lambda[\ln \hat{y} - \ln \hat{y}^*],$$

where $\lambda = (1 - \alpha)(x + n + \delta)$, showing the speed of income convergence to steady-state. Solving this differential equation and rearranging after subtracting $\ln \hat{y}(0)$ from both sides of the result then gives

$$(22) \quad \ln \hat{y}(t) - \ln \hat{y}(0) = (1 - e^{-\lambda t}) \ln \hat{y}(t)^* - (1 - e^{-\lambda t}) \ln \hat{y}(0).$$

Lastly, since (12) defines $\hat{y}(t)^*$, substituting this into (22), and converting the equation into per capita units, produces the following convergence equation:

$$(23) \quad \ln y(t) - \ln y(0) = (1 - e^{-\lambda t}) \left[\ln A(0) - \ln y(0) + \left(\frac{\alpha}{1-\alpha} \right) \ln s \right. \\ \left. + \left(\frac{\alpha\theta}{1-\alpha} \right) \ln q + \left(\frac{\alpha\rho}{1-\alpha} \right) \ln \gamma \right. \\ \left. - \left(\frac{\alpha}{1-\alpha} \right) \ln(x + n + \delta) \right] + \lambda t.$$

Once again, adding a stochastic term and assuming that the analysis covers a fixed period of time simplifies (23) to

$$(24) \quad \ln y(t) - \ln y(0) = \mu + \beta_1 \ln y(0) + \beta_2 \ln s + \beta_3 \ln q + \beta_4 \ln \gamma \\ + \beta_5 \ln(x + n + \delta) + \varepsilon,$$

where $\mu = [(1 - e^{-\lambda t}) \ln A(0)]$, β_i is the corresponding coefficient on each variable, and ε is the error term. Both (23) and (24) show how do the major elements of the model economy affect the rate of output growth during the transition period. For instance, equation (23) reveals that the growth rate is positively related to savings ratio but is negatively associated with the initial income level and the effective depreciation rate. More importantly, the equation implies that institutions do affect the speed of economic progress. As the positive coefficient appearing in (23) suggests, an economy surrounded by high-quality institutions would record a faster growth rate during the period of transition. Therefore, the above results imply that, at least in the short run, institutions have *growth* effects besides their *level* effects. On the other hand, these two equations indicate that the lack of convergence in income levels may directly originate from permanent differences in institutional structures. For example, according to (23), a backward country having a lower level of initial income might not succeed in recording higher growth rates than a previously prosperous country if it has low-quality institutions that either totally or partially suppress its advantage of starting behind. Given this result, the present

model then asserts that if the transition period is quite long, the lack of empirical support for the Solow-type convergence is not an anomaly. Indeed, what the growth model at hand implies is that this phenomenon is a natural outcome once the institutional differences are regarded. Finally, the derived convergence equation suggests that, beyond institutions, other country-specific factors are also influential over the growth rate while the economy is approaching its steady-state income level. As Equation (23) shows, there is a positive relationship between well-natured structural characteristics and the growth rate: countries having positive social or cultural features that lower the level of frictions in the capital market would grow faster than others. Consequently, the model points out the fact that the incompatibility between the convergence hypothesis and the observed empirical patterns in global inequality may be due to cultural/social differences, besides institutional disparities.

To sum up, the model introduced in this section indicates that institutional factors are among the main determinants of economic development and prosperity. The analysis shows that high-quality institutions that facilitate capital market transactions primarily boost new investments and then foster both capital formation and output production in the long run. More than that, the model reveals that at least during the transition period, institutional differences can lead to cross-country growth differentials, which suggests a partial explanation for the absence of a clear convergence pattern among income levels in the world. Besides identifying these theoretical links, the model also brings out guidance for the empirical side of the relationship by proposing several regression equations that explicitly show the size and direction of the impact of institutions on capital stock, income, and economic growth. In this respect, the present model does not solely represent a theoretical improvement but corresponds to a promising contribution to the empirics of the growth analysis as well. As a final note, the above analysis illustrates how other country-specific factors (i.e., social, cultural, or structural factors) that are related to market frictions can affect the capital accumulation and economic development process. Therefore, instead of providing a limited approach that only considers institutional factors, this model offers a contentful framework that allows for a detailed examination of the growth process.

Even though the growth model under consideration seems to be useful regarding both the theoretical and empirical aspects, it has several drawbacks. First of all, the model assumes that institutions are constant over time. That is, it does not consider the fact that institutional factors are changing and evolving as economic, political, and social structures change. Second, the above analysis treats institutions as exogenous and focuses solely on the impact of predetermined institutional factors on the economic performance of countries. Therefore, it bypasses some of the critical issues about the nature of institutional differences, including why some nations have better institutions than others or which factors have been playing a role in the process of institutional development. But, as a matter of fact, these questions are as important as the analysis of the relationship between institutions and economic development. Accordingly, despite its practical advantages, one should consider the present model as perambulatory, and draw more attention to shed light on the process of institutional change.

In line with the considerations mentioned above, the following section introduces a model that accounts for institutional evolution together with its impacts on the process of economic development. In particular, by identifying the role of governments in the formation of institutional structures, the upcoming section addresses some critical issues raised above, such as how institutions change over time or why there are variations in institutional development across countries. The details of the provided explanations and the corresponding model are as follows.

2.3. MODEL 2: THE GOVERNMENT, INSTITUTIONAL DEVELOPMENT AND ECONOMIC GROWTH

2.3.1. Theoretical Background

In the previous section, the suggested version of the Solow model incorporated institutional factors into growth analysis and showed that institutions are one of the critical factors that shape the long-run development path of economies. In doing so, however, that model has made some rigid assumptions about the disposition of institutions. For instance, the model elementarily treated institutions as

fixed factors and did not consider their ever-changing nature. Also, following a parsimonious approach, the model assumed institutions as exogenously determined structures and ignored the underlying mechanisms of institutional development. But, as is well known in real-life, institutions neither appear naturally nor last forever once they emerge. Instead, they are developed by societies to maintain law and order, and when social preferences and structures change, they tend to change, too (North, 1991: 97-102). In this context, it is clear that the model economy shown above was quite insufficient to represent the true nature of an economic environment. In fact, that model should be augmented in several aspects to be able to provide a more realistic framework.

Before anything else, the model first needs to be reconfigured in a way that it explicitly defines the time path of institutional changes to give a more coherent explanation of the institutional evolution. More importantly, to elucidate the variations in institutional framework across nations, the structure of the model has to be modified so that it identifies the main mechanisms and actors that drive institutions to evolve in line with the preference of societies.

In the political economy literature, one of the foremost acknowledgments is that the government is the principal actor in the process of designing and developing formal institutions. Due to their natural monopoly position in the use of force, governments are regarded as the ultimate authorities that set out general rules and incentive structures of the economic environment in which agents interact with each other (Acemoglu and Robinson, 2013: 80-81; Acemoglu and Robinson, 2020: 16-37; Smith, 2006, 767-917). Hence, government policies, and in particular, the economic, social, and political factors affecting these policies, are thought of as the principal determinants of the extent and the structure of the formal institutional arrangements, such as constitutions, legal systems, or laws that protect the private property rights (Acemoglu and Robinson, 2013: 79-87; Barro, 1990: 115-116; North, 1991: 109; Smith, 2006, 788-804; Yeldan, 2009: 64-66).

Given these arguments, it is apparent that differences in institutional practices are closely related to variations in actions/preferences of a government (or a group of people responsible for the executive function). Accordingly, this strand of the literature basically points out the fact that while analyzing the process of institutional

development, it is necessary to take into account the role of the government in the formation of institutions, all above else. Otherwise, as it would miss out on the obvious impact of government on shaping institutions, the analysis would be likely to fall short of revealing the foundations of institutions, and therefore, it would not be so useful to examine the associated results of institutional changes.

Until recently, several studies considering those arguments raised above, have suggested economic models that elaborate on the role of governments in altering institutional arrangements and economic outcomes. For instance, in one of these studies, Meltzer and Richard (1981: 917-923) set out a general equilibrium model showing how political processes that reflect social and economic preferences of voters exert influence on government decisions about the form of institutional arrangements, including redistribution mechanisms and taxation. Similarly, Becker (1983: 373-394) proposed a theory in which the equilibrium incentive structure set by the government is dependent on political preferences. By using a static framework, he showed that politically powerful groups that control the executive function could be influential over the resultant set of regulations in societies. In fact, he illustrated that such political groups would tend to rearrange the tax structure, the subsidy mechanism, and in general, the rules governing the resource allocation so as to enrich themselves.

Apart from those studies that focus on static effects, some researchers developed models to analyze the dynamic relationships among the state, institutions, and economic outcomes. For example, Przeworski and Wallerstein (1988: 14-24) laid out a model of growth that reveals theoretical interactions between the type of government, income distribution, and growth rate. They showed that, at any instant of time, the trade-off between income distribution and growth rate is dependent on the institutional framework developed by a particular type of government: while a pro-capital government that establishes institutions to favor the capitalists would lead the economy to a rapid growth phase at the expense of widened inequality, a pro-labor government, which changes institutional framework to enhance the welfare of the laborers, would contrarily drive the economy to a slower growth path but a relatively equal form of distribution. Thus, based on these implications, the study concluded that the political preferences of states, and in particular, the decisions of

the ruling class that alter state policies, are the ultimate determinants of the institutional structure and the corresponding economic performance of nations.

In another study, Barro (1990: 104-122) proposed an endogenous growth model that reveals the role of governments in determining the long-run growth path of an economy. Assuming public spending as an additional input to the production function, he showed that the steady-state growth is associated with government expenditures on physical infrastructure and other productive services. Also, the model suggested in that paper ascertained that, at least in theory, productive government spending and the tax burden have opposite effects on income and consumption growth. On the other hand, although the study briefly mentioned the role of the government in sustaining law and order and securing property rights, it did not explicitly model the link between government policies and institutional structures. Instead, the theoretical framework offered by Barro (1990) has solely considered the supplementary role of government spending in the production process and ignored possible interactions among the state and institutions. Recently, however, Barro and Sala-i-Martin (2004: 143-152) have suggested more comprehensive models that demonstrate the respective effect of different incentive structures established by the government on output production, consumption, and economic growth. Developing a number of models along the same lines, Acemoglu (2009: 781-860) also showed that institutional arrangements, reflecting various types of political preferences and government policies, have considerable impacts on the growth rate and distribution of income.

Parallel to those arguments mentioned in the literature, this section suggests a formal theory of growth that considers the close relationship between government policies and institutional framework. Briefly, the model shown below hinges on the idea that government is the only responsible agent for the establishment of institutions that secure property rights and facilitate market transactions. It also supposes that the process of institutional development is positively related to the level of resources devoted by the government to enhance institutional quality: the higher the share of government spending on institutional development, the better would be the institutional quality. Further, following Barro (1990), who incorporates government expenditures into production function, the model presumes institutions

as one of the essential inputs of the production process. Thus, it proposes that the share of government spending devoted to enhancing institutional quality has direct impacts on output production and the long-run prosperity. Lastly, the theory suggests that the level of institutional development, or alternatively, the quality of institutions set by the government, is associated with the growth rate of an economy during the transition period. Accordingly, it indicates that assuming all other things being equal, cross-country variations in growth rates would partially reflect differences in institutional quality and government policies. Indeed, the analysis shows that, once these differences are regarded, convergence would occur among a group of countries with similar characteristics. Consequently, the results of the present model reveal the fact that the tradition of ignoring institutional factors in growth studies might be one of the reasons for the weak empirical support provided for the convergence hypothesis until recently.

Compared to the models developed in the literature, the model discussed below has three distinctive features. First, unlike the majority of the previous models that reduce institutional arrangements to tax policies (Meltzer and Richard, 1981; Przeworski and Wallerstein, 1988), the model at hand treats institutions as factors different from taxes. Thus, in contrast to other studies, it allows for a theoretical examination of the economic impact of institutional arrangements other than government policies related to the tax structure.

Second, while designing their models, many studies in the literature supposed that the state could transform political and economic preferences of society into policies or institutional arrangements without bearing any cost (Barro and Sala-i-Martin, 2004; Meltzer and Richard, 1981; Przeworski and Wallerstein, 1988). In other words, the common assumption followed by previous studies is that the institutional evolution process is costless and can be organized by the government without devoting any resources. For that reason, none of these studies have proposed a particular mechanism that explicitly reveals how governments arrange and finance institutional changes. Quite the contrary, the current analysis assumes that there are some costs to change or govern institutions. Moreover, it supposes that all these costs associated with institutional changes are covered by the state through taxation. Accordingly, the model at hand provides quite a different framework than others

since (1) it allows for explaining the process of institutional changes within the context of the government budget, and (2) it makes it possible to analyze the benefits of institutional changes together with the burden of taxes.

Lastly, most of the previous studies have suggested models in which output production is assumed as a process independent of institutional factors (Mankiw et al., 1992; Przeworski and Wallerstein, 1988; Romer, 1990; Solow, 1956). Contrary to this tradition, the model at hand regards institutions as one of the factors of production based on the assumption that there would be little incentive to produce something when the economy is operating in a completely insecure and unsteady environment. Thus, in comparison to studies that consider output production solely as a passive process carried out within a given institutional setting, the model supposes a more realistic and dynamic production process in which institutional changes could be directly reflected in production decisions. On that account, the present model can be regarded as a far more reliable approach than previous attempts to examine the association between output production and institutional factors.

2.3.2. The Model

The growth model introduced in this section envisages a closed economy where institutions have direct impacts on production decisions. Accordingly, unlike many of the neoclassical models, the present model proposes a production function that considers the institutional framework of an economy as an essential input alongside other factors such as capital and labor. To be more specific, the model assumes that the production at any particular time, t , is determined by the following function:

$$(25) \quad Y(t) = K(t)^\alpha P(t)^\beta [A(t)L(t)]^{1-\alpha-\beta}, \quad \begin{aligned} &(0 < \alpha, \beta < 1) \\ &(\alpha + \beta < 1) \end{aligned}$$

where P is the level of institutional development regarding property rights, α and β are respective weights of capital and institutions in the production, and all other variables are defined as in the previous model. Briefly, equation (25) states that, in

addition to the traditional factors, such as physical capital, labor, and technology, output production is dependent on the quality of existing institutions. It also implies that productive activities only take place in an economy where there are institutions that ensure at least a minimum level of protection for private property rights. In the absence of such institutions, i.e., $P = 0$, equation (25) suggests that there would be no production in the model economy. Therefore, the model implicitly assumes that the establishment of particular institutions is as important as other factors for an economy to maintain output production.

Once again, it is supposed that population and technological capacity is respectively growing at a rate of n and x :

$$(26) \quad L(t) = L(0)e^{nt},$$

$$(27) \quad A(t) = A(0)e^{xt}.$$

On the other hand, following the arguments suggested by Barro (1990), this model presumes that the economy involves a government that raises funds through taxation to finance its expenditures. Further, it supposes that this government runs a balanced-budget and collects revenues by imposing a flat-rate tax on income. That is,

$$(28) \quad G = T = \tau Y, \quad (0 < \tau < 1)$$

where G stands for the level of government spending, T denotes the total tax revenue, and τ refers to the rate of income tax ranging between 0 and 1. The distinctive assumption of the model is that the government uses a proportion of its revenues, m , to develop and maintain institutional structures favorable to productive activities. Indeed, the model assumes that the process of institutional development is solely ruled by the government. That is, the state is the ultimate authority that governs the time path of institutional changes. On the other hand, it supposes that the remaining share of tax revenues, $(1 - m)$, is used by the government to finance some of its expenses that are not directly associated with the production process. Given all these assumption, the model then suggest that the evolution of an economy's institutional framework is determined by the following equation:

$$\begin{aligned}
m\tau Y &= \dot{P}(t) + \delta P \Rightarrow \\
(29) \quad \dot{P}(t) &= m\tau Y - \delta P, \quad (0 < m < 1)
\end{aligned}$$

where $\dot{P}$ refers to the change in the level of institutional quality, m is the share of tax revenues devoted to institutional development, and δ is the depreciation rate. The first term on the right-hand side of the above equation indicates that institutional evolution is positively related to two different factors: (i) the resources allocated by the government to enhance the institutional quality, m , and (ii) the capacity of the state to collect taxes, τY . Conversely, the term appearing after the minus sign, δP , illustrates that the level of deterioration in existing institutions has a negative impact on the process institutional development. Thus, the equation suggests that the quality of an economy's institutional framework, i.e., the quality of its laws that impedes seizure or that secures private property rights, would only increase if the government spending on institutional development is higher than the rate of decay in the existing institutions. Otherwise, it shows that the institutional quality will decline over time as the government fails to replace the outdated laws and arrangements with new ones necessary to meet the contemporary needs of the economy. Therefore, equation (29) denotes that the model at hand regards institutional evolution as a process in which different factors have counterbalancing effects, as similar to that of capital accumulation.

Because of the fact that the economy is closed, and the government takes away a certain amount of income through taxation, the capital accumulation process is slightly different from the first model. In this model, the equation regarding the net change in the stock of capital is defined so as to reflect the tax burden on income. That is,

$$(30) \quad \dot{K}(t) = s(1 - \tau)Y - \delta K$$

where $\dot{K}$ refers to the change in physical capital stock, and s is the savings ratio.

The equations appearing in (29) and (30) represent two critical relationships that define the time paths of institutional development and capital accumulation. As is known, to analyze the steady-state behavior of the model economy, these

differential equations should be transformed into the per effective labor terms. For that reason, both equations are rewritten as follows:

$$(31) \quad \dot{\hat{p}}(t) = m\tau\hat{y}(t) - (x + n + \delta)\hat{p}(t),$$

$$(32) \quad \dot{\hat{k}}(t) = s(1 - \tau)\hat{y}(t) - (x + n + \delta)\hat{k}(t),$$

where $\hat{y} = \frac{Y}{AL}$, $\hat{k} = \frac{K}{AL}$, and $\hat{p} = \frac{P}{AL}$. Since equation (25) implies that $\hat{y} = \hat{k}^\alpha \hat{p}^\beta$, (31) and (32) can be expressed as below:

$$(33) \quad \dot{\hat{p}} = m\tau\hat{k}^\alpha \hat{p}^\beta - (x + n + \delta)\hat{p},$$

$$(34) \quad \dot{\hat{k}} = s(1 - \tau)\hat{k}^\alpha \hat{p}^\beta - (x + n + \delta)\hat{k}.$$

In order to solve the model, the economy under consideration is assumed to be at its steady-state equilibrium, which implies $\dot{\hat{k}} = \dot{\hat{p}} = 0$. Using this information in (33) and (34), and then solving the resulting equations for $\hat{p}$ and $\hat{k}$, respectively, gives the following relations:

$$(35) \quad \hat{p}^* = \left[\frac{s^\alpha (1-\tau)^\alpha \tau^{1-\alpha} m^{1-\alpha}}{x+n+\delta} \right]^{1/(1-\alpha-\beta)},$$

$$(36) \quad \hat{k}^* = \left[\frac{s^{1-\beta} (1-\tau)^{1-\beta} \tau^\beta m^\beta}{x+n+\delta} \right]^{1/(1-\alpha-\beta)},$$

where $\hat{p}^*$ and $\hat{k}^*$, respectively, denotes the equilibrium level of institutional development and capital in terms of per effective unit of labor. Basically, equations (35) and (36) indicate how steady-state levels of institutional development and capital stock vary with parameters of the model. For instance, equation (35) shows that institutional development is a function of the savings ratio, s , the income tax rate, τ , the share of government spending on institutions, m , and the effective depreciation rate, $(x + n + \delta)$. From this equation, it can be seen that institutional development is positively related to savings ratio: increases in the savings rate results in increases in the quality of institutions. Similarly, the results above state that the higher the share of government spending on institutions, the higher would be the

level of institutional development, suggesting a positive correlation between institutional quality and the government's weight given on institutional evolution. On the other hand, (35) reveals that the relationship between institutional development and the tax rate is an empirical matter: the tax rate has both positive and negative effects on the process of institutional evolution, and the sign of the overall impact is theoretically indeterminate. For example, on the positive side, the equation indicates that higher tax rates that increase the total revenues of the state might lead to better quality institutions. On the negative side, it contrarily implies that increases in the tax burden on productive activities could result in low-quality institutions in the long run. Accordingly, these findings demonstrate that the presence of a government in the model economy causes contradictory effects on the institutional development process. Finally, equation (35) states that the steady-state level of institutional development is related negatively to the rate of technological progress, population growth, and depreciation rate.

Besides the results regarding institutions, the derived equation for capital accumulation also highlights some of the critical implications of the model. For example, equation (36) shows that capital stock increases with the savings rate but decreases with the effective depreciation rate, as in the previous model. Moreover, it suggests that the aforementioned trade-off between the benefits and the burden of the government is prevalent for capital accumulation as well. According to results, the rate of income tax has conflicting effects on capital formation, and the net direction of the relationship is unclear. Besides this, (36) indicates that the steady-state capital stock is an increasing function of m , suggesting that the share of resources allocated to support institutional evolution is also conducive to the capital accumulation process. Therefore, the equation above implies that the decisions of the government about how much money to spend on institutions have a direct influence on private sector investments and capital formation. More importantly, it suggests that cross-national differences in the level of capital stock might be stemming from variations in government policies and the quality of resulting institutional arrangements. Thus, parallel to the findings of the first model, this growth model as well points to the need for high-quality institutions to promote capital accumulation in the long run.

To see the implications of the model regarding the income levels, remember that the intensive form of the production function is $\hat{y} = \hat{k}^\alpha \hat{p}^\beta$. Substituting (35) and (36) into this function would yield the equilibrium level of output per effective labor, $\hat{y}^*$, which is

$$(37) \quad \hat{y}^* = \left[\frac{s^\alpha (1-\tau)^\alpha \tau^\beta m^\beta}{(x+n+\delta)^{\alpha+\beta}} \right]^{1/(1-\alpha-\beta)}.$$

Then, multiplying both sides of this equation by $A(t)$ would give

$$(38) \quad y^*(t) = A(t) \left[\frac{s^\alpha (1-\tau)^\alpha \tau^\beta m^\beta}{(x+n+\delta)^{\alpha+\beta}} \right]^{1/(1-\alpha-\beta)},$$

which lays out key determinants of output per unit of labor in the long run. Essentially, equation (38) reveals that the equilibrium level of output per capita is determined by a number of exogenous factors. For example, the equation suggests that per capita income level is positively associated with the savings rate and technological capacity. This implies that countries having high savings rates and advanced technologies would reach higher income levels compared to countries with reverse characteristics. Conversely, equation (38) indicates that per capita income level is negatively related to the effective depreciation rate, as similar to the previous model. Assuming that x and δ do not vary much across countries, this means that high rates of population growth are detrimental to economic development. As is apparent from the equation, the results also suggest that government policies regarding institutional development play a significant role in determining the standards of living. According to (38), income level is an increasing function of the share of government spending on institutions, implying that countries in which governments give more importance to maintaining an inclusive institutional framework would achieve higher prosperity levels than others where governments disregard the development of relevant institutions. Therefore, the present model asserts that to enhance the wellbeing of society, governments should design policies in a way to develop high-quality institutions that secures property rights and lowers the risk of seizure. Otherwise, flaws in the process of institutional evolution would

hamper productive activities, and society would be destined to live with a low level of income in the long run. Lastly, similar to (35) and (36), equation (38) also points out the dual effect of government policies on the model economy. As the results show, the tax rate enters into equation with both plus and minus signs, and the net effect of taxes on the equilibrium income level is ambiguous. Accordingly, the model implies that the direction of the relationship between taxation and economic development is theoretically unclear and can only be specified with the help of empirical studies.

Although not shown explicitly, the analysis above suggests that institutional quality is crucial for countries to reach high-income levels. When all other things equal, equation (38) indicates that per capita income level is positively associated with the share of government revenues devised for enhancing institutional quality. Nevertheless, this equation primarily establishes a link between government policies and income levels. That is, it proposes only an indirect relationship between institutional structures and prosperity. However, the results of the model could be modified so as to reveal the direct mechanism of interactions between these two. To discover the exact way of association between institutional quality and economic development, the only thing that should be done is to express equation (38) in a way so that it embraces the influence of institutional factors. To do this, note first that (35) can be rewritten in terms of m as follow:

$$(39) \quad m = \tau \left[\frac{(p^*)^{(1-\alpha-\beta)}(x+n+\delta)}{A(t)^{(1-\alpha-\beta)}s^\alpha(1-\tau)^\alpha} \right]^{1/(1-\alpha)},$$

where p^* denotes per capita level of institutional development at the steady-state. Then substituting this into (38) and rearranging terms after simplifications gives the following equation for output per capita:

$$(40) \quad y^*(t) = A(t)^{(1-\alpha-\beta)/(1-\alpha)} \left[\frac{s^\alpha(1-\tau)^\alpha(p^*)^\beta}{(x+n+\delta)^\alpha} \right]^{1/(1-\alpha)}.$$

Briefly, equation (40) shows that the equilibrium level of output per capita is directly associated with the level of institutional development. In particular, it

indicates a positive relationship between the quality of institutions and standards of living: as long as all other things being equal, income level increases as institutions become more developed. Hence, parallel to the findings of the previous model, this equation reveals that the quality of the institutional framework is one of the leading determinants of an economy's level of prosperity.

Before passing to discussions regarding growth rates, notice that (38) or (40) can be expressed in the form of an equation that is suitable for empirical analysis. For instance, taking the natural logarithm of both sides of equation (38) would yield,

$$(41) \quad \ln y^*(t) = \ln A(0) + xt + \left(\frac{\alpha}{1-\alpha-\beta}\right) \ln s + \left(\frac{\alpha}{1-\alpha-\beta}\right) \ln(1-\tau) \\ + \left(\frac{\beta}{1-\alpha-\beta}\right) \ln \tau + \left(\frac{\beta}{1-\alpha-\beta}\right) \ln m - \left(\frac{\alpha+\beta}{1-\alpha-\beta}\right) \ln(x+n+\delta).$$

For a particular point in time, this equation can be rewritten as:

$$(42) \quad \ln y^* = a + b_1 \ln s + b_2 \ln \tau + b_3 \ln m + b_4 \ln(x+n+\delta) + \epsilon_1,$$

where $a = \ln A(0)$, b_i stands for the respective coefficient on each variable, and ϵ_1 denotes the disturbance term. Following the same steps, (40) can also be expressed as a regression equation as below:

$$(43) \quad \ln y^* = c + d_1 \ln s + d_2 \ln(1-\tau) + d_3 \ln p^* + d_4 \ln(x+n+\delta) \\ + \epsilon_2,$$

where $c = \left(\frac{1-\alpha-\beta}{1-\alpha}\right) \ln A(0)$, d_i is the corresponding coefficient of a particular variable, and ϵ_2 is the error term. The last two equations show how variations in the steady-state level of income can be approximated by a number of exogenous factors. Also, equations (42) and (43) demonstrate that income differences across countries can be estimated using two different strategies. Given a particular interest, one can regress income either on m , which reflects differences in government policies regarding institutional development, or, on p^* , which directly captures the variations in resulting institutions. In this respect, the model at hand introduces a content-rich

and versatile framework that one can manipulate easily in line with a predetermined purpose. Moreover, both (42) and (43) imply that, once there are appropriate proxies, one can gauge the partial contribution of each variable in the model to the existing differences in income levels.

Apart from those inferences regarding the long-run behavior of incomes, the model has some important implications about the growth pattern of income levels as well. First, as in the previous model, the model reveals that income per capita grows at the rate of technological progress when the economy is at its steady-state equilibrium. That is,

$$(44) \quad \frac{\dot{y}}{y} = \frac{\dot{A}}{A} = x.$$

This equation replicates the well-known outcome of the original Solow model suggesting that technological improvements are the ultimate source of per capita income growth in the long run. Therefore, (44) indicates that behavioral parameters of the model, such as the savings rate, the tax rate, or the share devoted to institutional development, have no direct influence on the rate of growth at the stable equilibrium.

Consider now what the theory implies about the factors governing the growth rate during the transitional period. One of the notable results of the present model is that government policies regarding the process of institutional evolution do affect the growth performance out of the steady state. Indeed, the derived equations of convergence suggest that the level of importance given to institutional development and the quality of resulting institutions are among the main determinants of underlying differences in growth rates. To see this formally, write first the intensive production function, $\hat{y} = \hat{k}^\alpha \hat{p}^\beta$, in the following growth form:

$$(45) \quad \frac{d}{dt} (\ln \hat{y}) = \alpha \frac{\dot{\hat{k}}}{\hat{k}} + \beta \frac{\dot{\hat{p}}}{\hat{p}}.$$

Then, substitute (33) and (34) respectively into (45), and rewrite the outcome in terms of $\ln \hat{k}$ and $\ln \hat{p}$ as follows:

$$\begin{aligned}
(46) \quad \frac{d}{dt}(\ln \hat{y}) &= \phi(\ln \hat{k}, \ln \hat{p}) \\
&= \alpha[s(1 - \tau)e^{(\alpha-1)\ln \hat{k}}e^{\beta \ln \hat{p}} - (x + n + \delta)] \\
&\quad + \beta[\tau m e^{\alpha \ln \hat{k}}e^{(\beta-1)\ln \hat{p}} - (x + n + \delta)].
\end{aligned}$$

For (46), taking a two-dimensional first-order Taylor-series expansion at around the steady state would yield:

$$(47) \quad \frac{d}{dt}(\ln \hat{y}) = -\omega[\ln \hat{y} - \ln \hat{y}^*],$$

where $\omega = (1 - \alpha - \beta)(x + n + \delta)$, denoting the rate of convergence to the stable equilibrium. Since the solution of the differential equation appearing in (47) is

$$(48) \quad \ln \hat{y}(t) = (1 - e^{-\omega t}) \ln \hat{y}(t)^* + e^{-\omega t} \ln \hat{y}(0),$$

using the equilibrium value $\hat{y}(t)^*$ given in (37) and then subtracting $\ln \hat{y}(0)$ from both sides of (48) would lead to

$$\begin{aligned}
(49) \quad \ln \hat{y}(t) - \ln \hat{y}(0) &= (1 - e^{-\omega t}) \left[\left(\frac{\alpha}{1-\alpha-\beta} \right) \ln s + \left(\frac{\alpha}{1-\alpha-\beta} \right) \ln(1 - \tau) \right. \\
&\quad + \left(\frac{\beta}{1-\alpha-\beta} \right) \ln \tau + \left(\frac{\beta}{1-\alpha-\beta} \right) \ln m \\
&\quad \left. - \left(\frac{\alpha+\beta}{1-\alpha-\beta} \right) \ln(x + n + \delta) - \ln \hat{y}(0) \right].
\end{aligned}$$

This equation shows the growth dynamics of the model in per effective labor terms. Finally, rearranging terms after converting (49) into per capita units would produce the following convergence equation:

$$\begin{aligned}
(50) \quad \ln y(t) - \ln y(0) &= (1 - e^{-\omega t}) \left[\ln A(0) - \ln y(0) + \left(\frac{\alpha}{1-\alpha-\beta} \right) \ln s \right. \\
&\quad + \left(\frac{\alpha}{1-\alpha-\beta} \right) \ln(1 - \tau) + \left(\frac{\beta}{1-\alpha-\beta} \right) \ln \tau \\
&\quad \left. + \left(\frac{\beta}{1-\alpha-\beta} \right) \ln m - \left(\frac{\alpha+\beta}{1-\alpha-\beta} \right) \ln(x + n + \delta) \right] + \omega t.
\end{aligned}$$

The expression above summarizes the predicted relationships between per capita income growth and key variables of the model during the transition period. To start with, (50) states that traditional Solovian elements have growth effects similar to those suggested in the previous model. While the savings ratio and the level of technological development have positive impacts on the transitional period growth rate, the initial level of income, and the effective depreciation rate have an opposite effect, respectively. Besides these, the equation indicates that the tax rate and government policies regarding the institutional framework play significant roles in determining the growth performance of economies. According to the results, the income tax rate has both positive and negative impacts on the growth rate as a reflection of the dual nature of government involvement in the economy. On the one hand, (50) implies that increases in the tax rate that enhance the ability of government to foster productive activities would raise the per capita growth rate, but on the other hand, it indicates that higher tax rates on income would slow down the speed of growth because of their distortive effects on the incentive structure and resource allocation. Therefore the model suggests that the taxation has divergent effects on the transitional period growth rate and the result of tax policies on convergence dynamics is unclear, at least in theory.

Apart from taxes, equation (50) shows that the growth rate is also dependent on the government's approach to institutional development. The positive coefficient on $\ln m$ means that the growth rate of per capita income would rise as the government increases the share of tax revenues reserved for enhancing the institutional quality. Accordingly, the model predicts that there would be differences in growth rates between countries in which the government devotes large amounts of resources to support institutional development and those in which the government spends only small amounts of money on the maintenance of institutions. Thus, the main implication of the present model is that income levels would show a converging pattern only if countries have similar policies about the process of institutional development. Otherwise, income levels would not tend to converge even among countries having the same savings ratio, the rate of technological progress, and the population growth rate. Hence, similar to the first one, the present model also

implies that differences in preferences on institutional arrangements might have a role in the widening income gaps among countries over the years.

To see directly how variations in the quality of resulting institutions affect growth performance during the transition to the steady-state, remember that equation (50) can be rewritten in terms of institutional quality rather than the share of government revenues. As before, this can be done by substituting (40) instead of (37) in equation (48), which would give:

$$(51) \quad \ln y(t) - \ln y(0) = (1 - e^{-\omega t}) \left[\left(\frac{1-\alpha-\beta}{1-\alpha} \right) \ln A(0) - \ln y(0) \right. \\ \left. + \left(\frac{\alpha}{1-\alpha} \right) \ln s + \left(\frac{\alpha}{1-\alpha} \right) \ln(1 - \tau) + \left(\frac{\beta}{1-\alpha} \right) \ln p^* \right. \\ \left. - \left(\frac{\alpha}{1-\alpha} \right) \ln(x + n + \delta) - \left(\frac{\beta}{1-\alpha} \right) xt \right] + xt.$$

Equation (51) reveals that the growth performance of an economy is directly associated with the quality of its institutions during the transition period. The results indicate that there is a positive relationship between institutional quality and economic growth: the higher the quality of institutions, the better would be the growth performance of an economy, all other things being equal. Therefore, equation (51) suggests that even small differences in the quality of institutions might lead to considerable differentials in the growth paths followed by economies. In addition, this expression provides a partial explanation to the question of why there has been divergence rather than convergence between poor and rich countries. As the results imply, if an initially prosperous country has better quality institutions than a backward country has, it would continue to record higher growth rates compared to its counterpart. Accordingly, (51) states that even they have similar economic and demographic features, the initially poor countries could fail to catch up with the rich ones. As a result, the present model implies that systematic and persistent differences in institutional structures might be one of the reasons for the lasting income inequality and observed differences in growth patterns.

Before closing this section, notice that equations (50) and (51) suggest two natural regression equations that can be used for testing aforesaid predictions of the theory. For instance, the regression implied by (50) is

$$(52) \quad \ln y(t) - \ln y(0) = \mu_1 + \theta_1 \ln y(0) + \theta_2 \ln s + \theta_3 \ln \tau + \theta_4 \ln m \\ + \theta_5 \ln(x + n + \delta) + \varepsilon_1,$$

where $\mu_1 = (1 - e^{-\omega t}) \ln A(0)$, θ_1 to θ_5 are the corresponding coefficients, and ε_1 is the error term. Similarly, assuming $\mu_2 = (1 - e^{-\omega t}) \left(\frac{1-\alpha-\beta}{1-\alpha} \right) \ln A(0)$, equation (51) suggests:

$$(53) \quad \ln y(t) - \ln y(0) = \mu_2 + \lambda_1 \ln y(0) + \lambda_2 \ln s + \lambda_3 \ln(1 - \tau) \\ + \lambda_4 \ln p^* + \lambda_5 \ln(x + n + \delta) + \varepsilon_2,$$

where λ_i and ε_2 denote the coefficient on each variable and the disturbance term, respectively. Equations (52) and (53) mainly indicate that cross-country differences in growth rates can be estimated with the help of a few variables, including the savings ratio, the income tax rate, the level of institutional development, and the effective depreciation rate. Also, these expressions show that depending on the availability of relevant data or given the question at hand, cross-national growth dynamics can be analyzed using different estimation strategies and regressions.

In sum, the theoretical model presented in this section reveals the fact that economic success is closely related to the process of institutional evolution. As shown above, the results indicate that high-quality institutions developed by the government are conducive to capital accumulation, output production, and economic growth. In this respect, the present model appears to replicate the main implications of the model introduced in the previous section. However, unlike the first one, this model treats institutional development as an endogenous process and offers a theoretical framework that considers not only the results of but also the reasons for the institutional evolution. Also, by assuming institutions as an essential input to the production function and defining the exact mechanism of interactions between the government and institutional framework, the model offers a novel approach to work on the economic impacts of institutions. Accordingly, in comparison to the previous analysis, this model of growth provides a more comprehensive framework to understand institutional changes and their reflections on the economic development process. Besides, it proposes several regression equations that can be used as a basis

for empirical analysis. Hence, in addition to its theoretical contributions, the model also provides a useful framework for formulating an estimation strategy to examine interactions between institutions, government policies, and economic performance.

2.4. CONCLUDING REMARKS

This chapter has proposed two different theoretical models that reveal the impact of institutional factors on economic growth and development. The first model, which extends the original Solow model by incorporating exogenously determined institutions into the analysis, has shown that high-quality institutions that lower transaction and information costs in the capital markets would foster both capital accumulation and economic progress. Therefore, this model of growth suggests that besides traditional Solovian variables (i.e., the savings ratio, the rate of technical progress, and population growth rate), institutional factors are also effectual on the capital formation and the long-term economic performance of countries. On the other hand, the second model in which the institutional evolution is modeled as an endogenous process governed by the state has shown that government policies regarding institutional arrangements have considerable effects on economic outcomes. The main prediction of the model is that countries having a government that secures private property rights and provides resources to foster institutional development would reach higher living standards compared to others whose governments neglect the evolution of institutional structure. Hence, the model naturally implies that differences in government policies and the corresponding differences in the quality of resulting institutions are the main reasons for the observed variations in prosperity across countries.

More generally, the models discussed above indicate the qualitative significance of institutions in the process of economic development. In line with the arguments raised by the institutions hypothesis, both models have proposed a number of theoretical mechanisms via which institutional factors affect key economic variables and the long-run development path of nations. Also, these models have suggested several regression equations that predicted the direction and the size of the implied relationships between institutional development, economic growth, and

prosperity. In this sense, these models provide a formal basis for studying the quantitative importance of institutions in the formation of global income distribution over time, which is the subject of the next chapter.

Apart from these theoretical and empirical implications, the analysis presented here suggests some policies and recipes regarding the development process of economies. For instance, the results imply that given the fact that high-quality institutions are conducive to capital formation, economic policies, especially those in countries with limited capital stock, should be directed at developing an inclusive institutional framework to accelerate the process of capital accumulation. That is, the theory states that while determining their policy agenda to enhance new investments, the governments in capital-poor countries should primarily consider long-term goals such as improving institutions instead of applying short-term macroeconomic policies regarding interest rates or exchange rates. Moreover, as the results reveal, institutional development is directly related to the growth performance out of the steady-state. Accordingly, low-income countries that aim to catch up with the economically prosperous countries should focus on, all else above, reforming their formal institutions and rules. Among these reforms, improving the conditions for the protection of property rights, providing efficient legal systems for the enforcement of contracts, and limiting disproportional political power seem to be the critical ones to foster economic progress, as noted before.

On the other hand, although these theoretical inferences are informative and compatible with economic reasoning, the practical validity of them is another question. For instance, the development process of countries may or may not go hand in hand with institutional development. Nations may remain as poor as they were even after making institutional reforms. Or, they can experience a quantum leap in economic prosperity following the purposeful improvements in the quality of institutional structures. From an empirical point of view, these are just a priori possibilities, and they imply that the actual impact of institutional differences on economic progress cannot be determined without compelling evidence. Considering all these facts, the next chapter provides a detailed analysis to shed light on the empirical relationship between institutions and economic performance and to test the main implications of the models introduced above. If one has to give some

information in advance, the results below look promising for the theory of institutions.



CHAPTER THREE

THE EMPIRICAL ANALYSIS

3.1. INTRODUCTION

In the previous chapter, the central focus of the analysis was the theoretical dimension of the relationship between institutions and economic performance. Accordingly, chapter two has shown how institutional structures could be integrated into theoretical growth models and then revealed the possible mechanisms and channels by which institutions can affect economic outcomes. With this chapter, the primary concern is shifted towards the empirical dimension of the relation. The main objective here is to examine whether the fundamental hypotheses proposed by the theoretical models are compatible with the actual data. More specifically, the present analysis aims to address a number of critical questions regarding the empirical relationship between institutional structures and economic performance. Do institutional differences matter for the economic development process? If they do, to what extent the diversity in income levels and growth rates linked to institutions? Are there any significant differences between types of institutions in terms of affecting the economic outcomes? Can these differences, if there are any, be exploited to develop policies that would help backward countries close income gaps with the rich ones?

As mentioned in the first chapter, several studies in the literature have already attempted to answer some of the questions above. Notable works that previously examined the empirical link between institutions and economic performance include Acemoglu et al. (2001), Acemoglu et al. (2002), Acemoglu et al. (2014), Assane and Grammy (2003), Dias and Tebaldi (2012), Easterly and Levine (2003), Esfahani and Ramirez (2003), Hall and Jones (1999), Knack and Keefer (1995), Mauro (1995), Rodrik et al. (2004), Rodrik and Wacziarg (2005), and Scully (1988), among others. Considered as a whole, the evidence provided by these studies seems to support the idea that institutional arrangements and economic performance have a close relationship: high-quality institutions tend to relate positively to economic progress and development. In addition to this, some studies have revealed that, given their

long-lasting effects, institutional factors are one of the main determinants of the economic fate of nations and societies (Acemoglu et al., 2001; Acemoglu et al., 2002; Rodrik et al., 2004; Easterly and Levine, 2003). For instance, Acemoglu et al. (2002) showed that institutions, rather than geography or culture, were the leading cause of the dramatic reversal in prosperity among nations over the last two centuries. Similarly, Acemoglu et al. (2001) and Rodrik et al. (2004) empirically demonstrated that the different forms of political, economic, and legal institutions developed in the colonization era are the fundamental reasons for divergent development paths that former colonies have followed until recently. Overall, these results suggest that institutions and institutional change have significant roles in the way of how global income distribution has taken its shape today. More than that, these findings pointed out the fact that the positive association between inclusive institutions and economic performance has a well-established place in the comparative development literature.

On the other hand, although better institutional structures have generally been shown to be conducive to economic progress, a few words should be said about empirical strategies of previous studies before considering their results as a vindication for the institutional theory. First, some studies above, including Knack and Keefer (1995), Rodrik and Wacziarg (2005), and Scully (1988) have attempted to test the institutions hypothesis without controlling for the potential endogeneity problem between institutions and income levels. Given the nature of the relationship between these two variables, it is clear that this approach would be inappropriate for testing the institutions hypothesis. As is well known, higher income levels might be the cause rather than the result of better institutions, which means that measures of institutions cannot be treated as exogenous variables in a regression of growth rates or income levels on institutions. Accordingly, rather than directly employing institutional variables themselves as regressors, one should use alternative methods or instruments that eliminate the potential income effect embedded in institutions to perform an analysis. Otherwise, the results would be unreliable and misleading, as they would probably fail to capture the impact of exogenous variations in institutions and instead would reflect errors stemming from the endogeneity problem.

Second, a review of the literature reveals that previous studies have often followed discretionary procedures instead of using formal theories to construct econometric models. For instance, except the papers by Dias and Tebaldi (2012) and Esfahani and Ramirez (2003) none of the studies mentioned above have relied on a theoretical model to determine the variables to be included in their analysis. For a number of reasons, this approach is quite inconvenient to design a regression model that aims to examine the relationship between institutional development and economic performance. Firstly, without the guidance of a properly developed theoretical model, one could erroneously neglect or disregard a variable essential to predict income levels or growth rates. Consequently, the omitted variable problem might appear and cast doubt on the consistency and robustness of the estimation results. Several studies in the literature, including Acemoglu et al. (2001), Easterly and Levine (2003), and Rodrik and Wacziarg (2005) seem to have this kind of problem. In none of these studies, the long-run determinants of welfare, namely, the investment rate, the saving rate and the population growth, were included in the analysis along with institutional, cultural, and geographical variables. Hence, their results could be biased in the sense that the coefficient estimates of institutional variables might spuriously reflect the effect of neglected variables on income levels.

Besides variable selection, deciding on the form of variables (i.e., whether the variables would be included in the model as logs, levels, or growth rates) and the specification of the regression equation (i.e., whether to use a linear or quadratic form) would become other critical issue when the theory is placed aside. To some extent, using previous knowledge, common sense, or intuition could be helpful for making such decisions and might not lead to serious estimation problems. But, as is well known, the specification of the model is one of the critical stages of empirical analysis and should be addressed elaborately. For that reason, instead of the arbitrary approach that many studies had followed before, using a theoretical framework would be a far more reasonable way to formulate a regression model. Otherwise, the analysis might suffer from several specification errors and produce delusive estimates of the true impact of institutional differences on economic prosperity.

Compared to a large number of empirical studies in the literature, this study offers a more reliable strategy to analyze the relationship between institutional

variables and economic performance. Following the above arguments, the formal part of the analysis has been formulated based on the theoretical models developed in chapter two. To be more specific, the regression models below have been designed in accordance with the convergence and income equations derived from the theory. As the discussion above implies, this approach is preferable to alternatives due to several methodological advantages that it brings along. For instance, when the theoretical framework is the guide, the misspecification errors would be less likely than those with alternative approaches since the formal theories would define the exact form of variables to be included in regressions. Also, to the extent that the theoretical models were determined correctly, this strategy would make it possible to overcome several critical problems, including the omitted variable bias.

Besides these efforts, the study has also attempted to address the endogeneity problem that several studies have neglected previously. As is well known, ordinary least squares (OLS) estimates would be biased and inconsistent if the simultaneity between institutions and income levels is ignored (Gujarati and Porter, 2009: 679-682). For that reason, one should use an alternative method that purifies the institutions of the influence of income levels to obtain reliable estimates. In the comparative development literature, the common solution to the endogeneity problem is to use instrumental variables that help dilute the effect of endogenous variations in institutional variables on regression estimates (Acemoglu et al., 2001; Hall and Jones, 1999; Mauro, 1995; Rodrik et al., 2004). Following this tradition, this study has employed several variables, including settler mortality rates, probability of speaking European languages, and initial level of human capital, as instruments for institutions. The results presented below show that these proxies, having passed the necessary tests, are valid instruments and doing a good job at resembling institutional variations across countries. Also, the analysis has revealed that once these variables are used as instruments for institutions, the estimated coefficients of institutional variables become consistent across different choices of samples, models, and specifications. Taken together, these results imply that the methodology and the instrumentation considered in the analyses are appropriate in the sense of examining the suggestions of the models developed in chapter two.

The empirical analysis in this chapter comprises of two parts. In the first part, the main objective is to introduce and highlight some of the relations between key variables of interest and institutions. Therefore, the study primarily focuses on pairwise correlations between institutional and economic variables to examine a number of critical relationships suggested by the theoretical models. Overall, the evidence from this analysis has shown that inclusive institutions are conducive to economic growth and development. The results have revealed that the higher the institutional quality, the higher the growth rate and income level, as supposed by the theory. Additively, the analysis has demonstrated that institutional differences seem to have non-negligible effects on the capital accumulation process. Both physical and human capital variables are found to be associated positively with high-quality institutions, suggesting that institutional development supports economic progress not only directly but also indirectly via capital accumulation.

In the second part of the analysis, the study aims to test the main implications of the developed theories using a formal approach. To this end, a wide range of regressions predicting the effect of institutions on growth rates and income levels has been estimated. In a nutshell, the analysis has shown that institutions are one of the leading determinants of economic growth and long-run prosperity. Both the cross-sectional and panel data estimates have revealed that institutional arrangements have significant effects on the level and the growth rate of income even after controlling for several factors, including the saving rate, initial income level, population growth, tax policy, cultural diversity, and unobserved country-specific features. More importantly, the evidence has shown that these effects remain sizable and significant regardless of the definition of institutions and the model specification considered in the analysis. This means that both political and economic institutions seem to play an important role in the process of development, as expected. On the other hand, the analysis also provides some evidence that the rate of capital accumulation, the initial level of development, ethnic fragmentation, and tax rates help explain cross-country variations in income levels and growth rates. But in general, the results show that most of these variables have relatively moderate impacts on economic performance compared to that of institutions. This gives further support to the hypothesis that institutions, rather than other factors, are the underlying causes of long-run

differences in economic performance. In this respect, the bottom line of the present analysis is that policy-makers that aim to foster economic growth and prosperity should principally focus on developing policies and institutions that secure property rights and enhance freedom in the political sphere.

The rest of the chapter is organized as follows. Section two introduces the data in general and presents evidence from the correlation analysis. Section three reports the results of cross-sectional and panel data regressions devised to test the implications of the theoretical models. Section four summarizes key findings and concludes the chapter.

3.2. THE DESCRIPTIVE ANALYSIS

This section presents the results of the preliminary analysis regarding the relationship between institutional structures and economic outcomes. As stated above, the main purpose here is to provide a brief insight into the question of how institutional differences in economic and political spheres do affect the development path of nations. Hence, the entire section below is devoted to cross-country analysis based on pairwise correlations between institutional variables and several economic indicators, including income levels, the growth rate, and capital accumulation.

In the present analysis, the relevant data come from three different sources. As before, data on economic variables are obtained from PWT version 9.0. Per capita income levels, which are employed to represent the levels of prosperity enjoyed in countries, are calculated using PPP adjusted real GDP (RGDP^c) values and population data. Similarly, the rates of economic growth that denote the average annual growth rate of income per capita are computed using the RGDP^{NA} data, as is the case in the first chapter.

In line with the theoretical framework, the current section also includes physical and human capital variables into the analysis to examine whether cross-country differences in institutional structures are associated with variations in capital formation. In order to measure the level of physical capital investments, the study employs data on the share of gross capital formation in GDP (at current PPPs) that denote the relative proportion of new investments to output within a given year. To

evaluate the quantitative differences in human capital, the analysis uses the human capital index created by the PWT 9.0 dataset, which measures the average quality of the workforce of a country based on information about years of schooling and returns to education. All the economic variables considered in the analysis are defined as averages over the period 1960-2014 so as to smooth out short-term fluctuations in the data.

As to measure the quality of institutional arrangements, this chapter employs two different variables that represent different dimensions of institutional development. The Legal System and Property Rights (LSPR) index, which is used to denote the quality of institutions in the economic area, comes from the Economic Freedom Dataset provided by Fraser Institute (Gwartney et al., 2019a). Briefly, the LSPR index is an equally weighted composite indicator of institutional development that summarizes information about several interrelated areas ranging from the legal enforcement of contracts to rules defining the structure of property rights. In this respect, it provides a comprehensive measure to evaluate the quality of formal institutions and the corresponding incentive structure of an economy. In order to quantify the assessment about the level of institutional development, this index assigns scores to each country that varies between 0 and 10, with higher scores representing better institutions in the economic sphere (Gwartney et al., 2019b: 1-23). Also, before specifying the ultimate score, the computed index was adjusted with a gender inequality coefficient so as to account for disparities in legal rights among genders. Therefore, the final LSPR scores assigned to countries represent not only the quality of existing institutions but also the extent to which the broad segments of society have benefited from these arrangements.

The second variable used as a measure of institutional quality is the Political Freedom (POLFREE) index, for which the raw data comes from the “Freedom in the World” report published by Freedom House in 2019. In short, the POLFREE variable equals the average of Civil Liberties (CL) and Political Rights (PR) indices, which measure the degree of freedom in different aspects of the political area. For instance, the civil liberties index primarily addresses issues like freedom of expression and belief, media freedom, freedom for organizational rights, and the rule of law. On the other hand, the index of political rights essentially captures elements

regarding the structure of the political sphere, such as electoral processes, the level of political pluralism, and the functioning of government (Freedom House, 2019b: 6-17). Therefore, combining these two indices, the POLFREE variable assesses the level of “inclusiveness” that citizens of a nation enjoy in the political environment. Unlike the LSPR index, however, the underlying data on the POLFREE index ranges from 1 to 7, with lower values correspond to more freedom in the political sphere. This means that while the rating of 1.0 assigned to a country represents the most inclusive political structure, a score of 7.0 stands for the least democratic environment in the political area (Freedom House, 2019a: 2).

As similar to their economic variables, both measures of institutional quality are included in the analysis as period averages. However, different from economic variables, institutional averages are computed using data from a more recent period between 2000 and 2014. This is for several reasons. First, the underlying data on both institutional measures were not available until the early 1970s. For example, the first dataset that includes the LSPR index was published in 1970. Similarly, the data on the POLFREE variable only became available in 1972 when Freedom House provided the first data on CL and PR indices.

Second, the quality of data regarding these institutional variables was quite questionable until recently, as the content and years considered in these indices have been changed frequently in time. For instance, the consistent estimates of the LSPR index on a yearly basis have only been provided since the year 2000. Before that year, the Fraser Institute offered data at five-year intervals and had not considered some of the critical topics covered today while generating the index scores. Similarly, data on the POLFREE variable were problematic until the 1990s, as the initial methodology and scope of CL and PR indices had been changed regularly to encompass new aspects of the political freedom concept. Also, in some of the editions of the Freedom in the World report published before 1990 (for example, in editions from 1982 to 1984), the freedom scores were defined so as to provide information about the political structure for a time interval instead of a particular year, which causes uncertainties while assessing the political situation of a country in a given year.

Nevertheless, most of these problems pertaining to institutional variables have been resolved lately. Since the 2000s, the methodology and the extent of LSPR and POLFREE indices were mostly standardized and formalized to cover additional dimensions of institutional arrangements. That naturally led these indices to become more reliable and comprehensive than they were in the past. Moreover, both of these institutional variables have recently become available on a yearly basis for a large set of countries, which made it possible to use comparable and confiding indicators of institutional development to evaluate cross-national differences in economic and political structures²⁰. Due to these methodological and practical reasons, the study pointedly employs LSPR and POLFREE scores averaged over 2000 to 2014 as proxies for institutional development in economic and political spheres, respectively.

The rest of this subsection presents results based on bivariate relationships between institutional quality indices and economic variables. The underlying dataset includes countries only with a population level of over one million in 2014 and having at least ten-year data on either of the institutional quality indices considered here. All calculations and estimations made in this section belong to the author. The results of the analysis and the discussions regarding these findings are as follows.

One of the central issues considered in this thesis is the question of how cross-country variations in economic prosperity relate to institutional differences. As to provide a baseline level of understanding about this relationship, this study plots income levels against institutional variables for a sample of countries for which data are available. The results based on different measures of institutional quality are illustrated graphically in Figure 4 and Figure 5. In these diagrams, the vertical axis measures the level of per capita GDP averaged over 1960 to 2014, while the horizontal axis represents the average value of institutional quality in the corresponding area. The bubbles appearing in each of these graphs denote population levels for countries, with larger bubbles indicating larger population size. Additively, in both diagrams, a linear regression line, for which the necessary information is

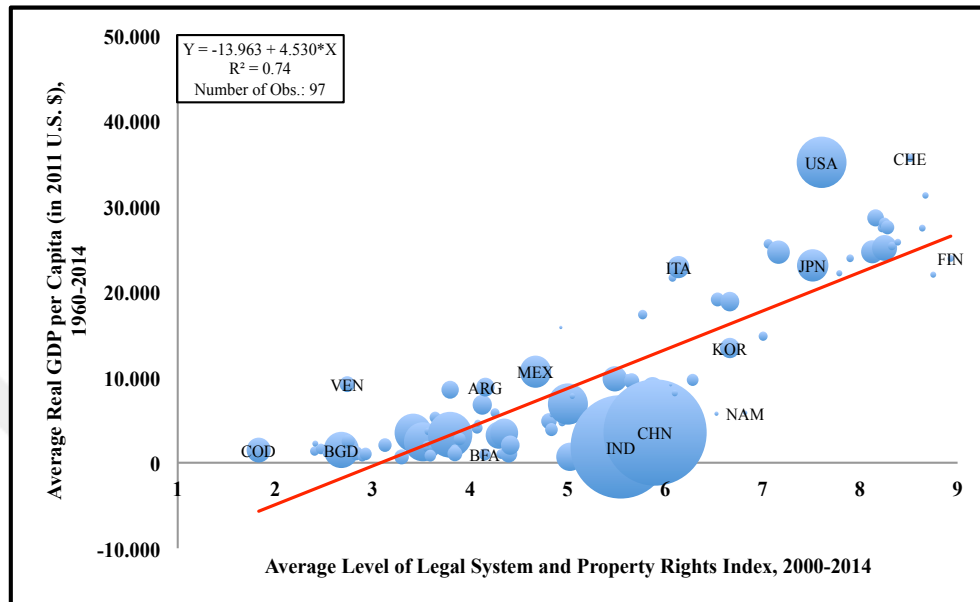
²⁰ For further information on methodological issues regarding these institutional variables, see the following websites:

<http://www.fraserinstitute.org/economic-freedom/approach>

https://freedomhouse.org/sites/default/files/2020-02/Methodology_FIW_2019_for_website.pdf.

given in a box, is included to indicate the direction of the relationship under consideration.

Figure 4: Scatterplot of Economic Development and Legal System and Property Rights Index, 1960-2014

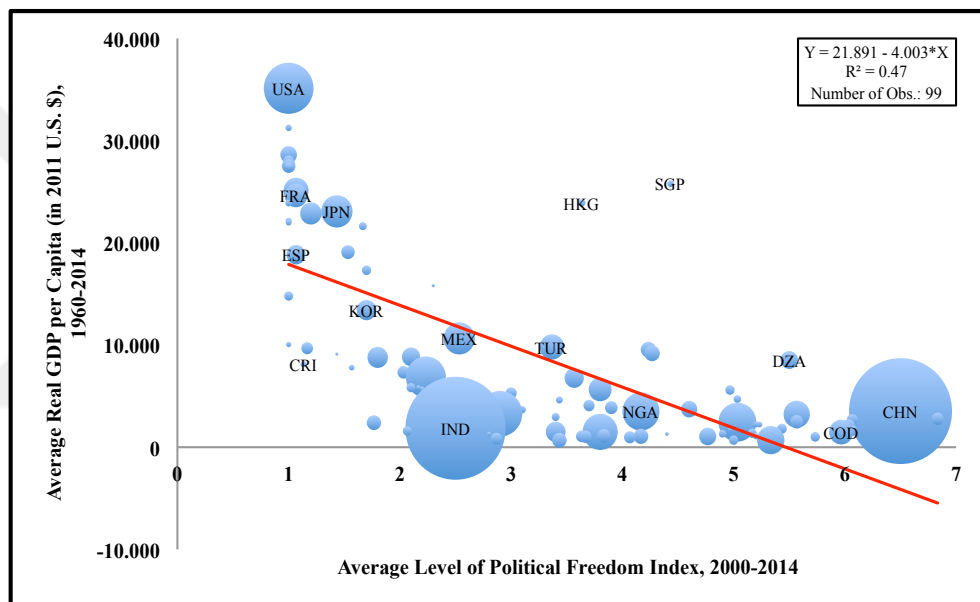


Source: Author's own calculations. The average real GDP per capita levels are computed from the population and RGDP^c data provided in Penn World Table version 9.0. Data on legal system and property rights index are from the Economic Freedom Dataset published by Fraser Institute.

To start with, the results in these diagrams seem to provide supportive evidence for the institutions hypothesis that predicts a positive association between institutional quality and economic prosperity. For instance, Figure 4 indicates that, on average, countries with better institutions in the economic sphere have higher income levels compared to others. As the estimated regression coefficient reveals, the average income per capita level rises by \$4,530 as the LSPR index increases by one point, implying that even modest improvements in the quality of economic institutions could have considerable effects on living standards. Besides this, the analysis shows that the value of the pairwise coefficient of correlation and the R^2 value of the regression are relatively high (0.85 and 0.74, respectively), which points out the fact that variations in income levels are closely associated with variations in the quality of institutions. On the other hand, a closer look at the scatter above discloses that the fit of the regression line to the data is far from being perfect. As

one can notice directly from the diagram, some countries enjoy much higher income levels than those implied by their LSPR values. For example, the U.S., Italy, and Venezuela are among this group of countries. On the contrary, some others, including China, India, and Namibia, have relatively lower income levels than those predicted by the regression line. Taken together, these findings suggest that, besides institutional factors, several other factors have also been a partial role to play in determining the welfare of nations.

Figure 5: Scatterplot of Economic Development and Political Freedom Index, 1960-2014



Source: Author's own calculations. The average real GDP per capita levels are computed from the population and RGDP^e data provided in Penn World Table version 9.0. The political freedom index equals the average of civil liberties and political rights indices, for which the raw data are provided in the Freedom in the World (2019) report published by Freedom House.

In parallel to results based on the LSPR index, the scatterplot of income levels against POLFREE scores indicates a close relationship between economic well-being and institutional development. The absolute value of the coefficient of correlation between per capita income levels and POLFREE scores is 0.68. Moreover, the data portrayed in Figure 5 predicate that, overall, richer nations tend to have better political institutions than the relatively poor ones, suggesting that economic prosperity goes hand in hand with inclusive political structures. In

addition, the value of the slope coefficient of the estimated regression implies that institutional reforms in the political environment are highly rewarding in the context of long-run development. As the estimation results manifest, a one-point decrease in the average score of the POLFREE variable lead per capita income to increase by approximately a level of \$4,000. Assuming all other things being equal, this means that if China, a relatively poor and politically unfree country, engage in reforming its political institutions to achieve the same level of freedom that the United States has, it would reduce more than two-third of the actual income gap between them²¹. Therefore, the estimation results illustrated in the diagram primarily state that at least some portion of the variability of income levels observed today might be due to differences in the level of democracy enjoyed in different parts of the world. However, the scatter chart above also reveals that income levels could vary among countries with similar POLFREE scores. For example, as the far left side of the diagram shows, per capita income levels are quite different for a sample of countries having democratic institutions. That means that factors other than the quality of political institutions have also an impact on the development level of nations. Nevertheless, once the general pattern in the data is considered, the evidence above appears to support the hypothesis that developing an inclusive institutional framework in the political sphere would promote economic prosperity.

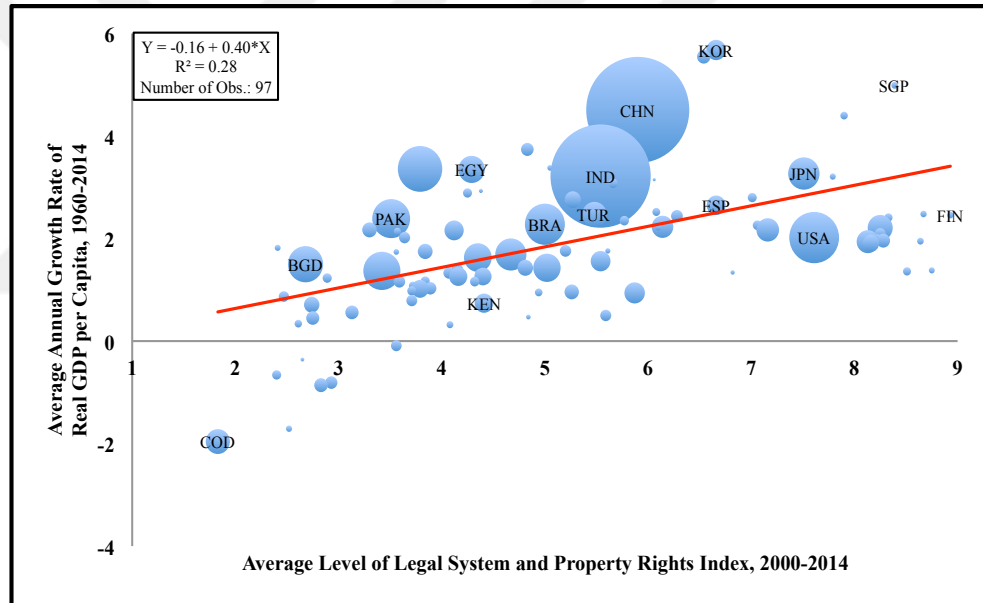
On the other hand, although these results are conceivable, in the sense that they corroborate with the institutions hypothesis, one should evaluate them warily. This is because such analyses predicated on two-variable regressions often neglect a number of critical problems associated with the estimation procedure, including the possible endogeneity problem among the variables or model specification errors. Additionally, these partial analyses naturally disregard other factors that may alter the magnitude or the direction of the revealed relationships. Therefore, one should avoid making ambitious inferences relying on such preliminary results. But, despite these caveats, it would not be so wrong to state that the positive relationship between

²¹ According to data on the POLFREE index, average freedom scores for the U.S and China are 1 and 6.5, respectively. In the same order, the average income levels for these countries are \$31,589 and \$3,536. Under the assumption of China and the U.S have the same POLFREE score, the level of income per capita for China would be equal to $\$25,552 \left(((6.5 - 1) * \$4,003) + \$3,536 \right)$. Therefore, the estimated average income difference would decline to \$9,573, which is approximately 30% of the original difference ($\$9,573/\$25,552$).

economic development and institutional quality documented above provides corroborative evidence for the institutional theory, albeit at an elementary level.

As discussed in the first two chapters, the institution hypothesis suggests that institutional development does not affect only income levels but also growth rates. According to the theory, countries with high-quality institutions that secure property rights and reduce the risk of expropriation would be likely to record higher growth rates than others, as they would be more successful in promoting productive activities. Therefore, the central claim of this hypothesis is that economic growth should be positively related to the quality of established institutions.

Figure 6: Scatterplot of Economic Growth and Legal System and Property Rights Index, 1960-2014

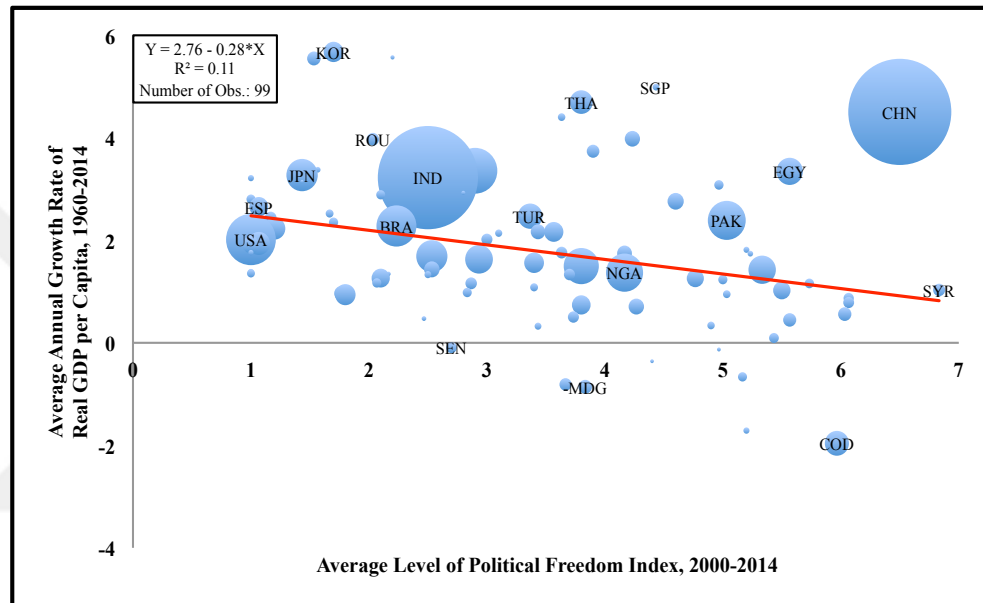


Source: Author's own calculations. The growth rate denotes the average annual growth rate of real GDP per capita computed from the population and RGDP^{NA} data provided in Penn World Table version 9.0. Data on legal system and property rights index are from the Economic Freedom Dataset published by Fraser Institute.

As to discover whether this presumption is empirically valid, Figure 6 and Figure 7 plots average annual growth rates of countries against their institutional quality scores. Overall, the results based on cross-country correlations seem to be compatible with the institutional approach. For example, Figure 6 shows that countries with high LSPR scores tend to grow at faster rates, as expected. The results shown in the diagram reveals that a one-point increase in the LSPR index is

associated with a 0.4% rise in the growth rate. Besides this, the analysis suggests that the R^2 value of the estimated regression is 0.28, which indicates that variations in the LSPR index alone can explain more than a quarter of the variability in growth rates. Taken as a whole, these findings imply that differences in institutional structures regarding legal systems and property rights might be one of the causes of observed differences in the long-run growth performance across countries.

Figure 7: Scatterplot of Economic Growth and Political Freedom Index, 1960-2014



Source: Author's own calculations. The growth rate denotes the average annual growth rate of real GDP per capita computed from the population and RGDP^{NA} data provided in Penn World Table version 9.0. The political freedom index equals the average of civil liberties and political rights indices, for which the raw data are provided in the Freedom in the World (2019) report published by Freedom House.

Performing the same analysis using the POLFREE variable did not create much difference in the above results. As Figure 7 shows, lower POLFREE scores are generally associated with higher growth rates, suggesting that countries having more democratic institutions tend to grow faster than others over the period analyzed. On the other hand, the analysis shows that there are several exceptions that prevent one from declaring this finding as a general rule. For example, as it can be noticed easily from the diagram, a set of countries, including China, Singapore, and Thailand, has shown outstanding growth performance during this period, although they have low-quality institutions in the political field. More important is that, unlike the previous

case, the overall fit of the regression line above is relatively low (0.11), which implies that growth rates are not as closely related to political institutions as they are to economic institutions. Nevertheless, the estimated value of the pairwise correlation for this set of countries is -0.33 and implies a clear negative association between growth rates and POLFREE scores. Hence, in broad terms, the results based on this measure of institutional quality seems to be compatible with the idea that inclusive political institutions, which distribute political power on a broad scale and promote freedoms regarding civil rights, are conducive to sustain high growth rates.

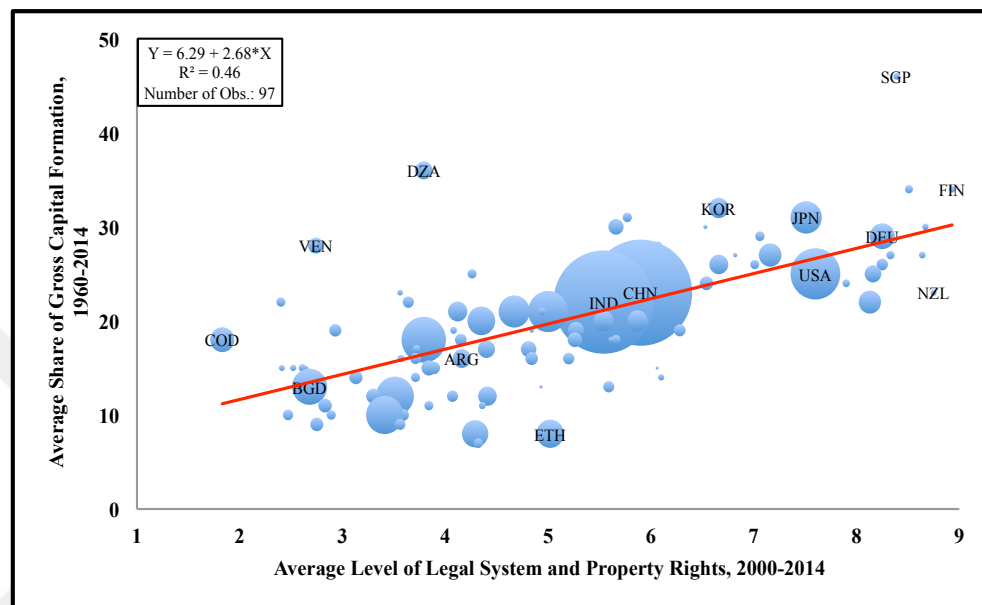
Up until now, the analysis focuses solely on the relationships between institutions and measures of economic performance, such as income levels and growth rates. But remember that both the institutions hypothesis and the formal models developed in the previous chapter suggest that institutional structures are also influential over the process of capital formation. As to remind again, the main assumption of the institutional theory is that economic actors would tend to engage in productive activities only when the associated transaction costs are low and future benefits are guaranteed by a set of rules and institutional arrangements. Accordingly, the theory asserts that the capital accumulation process should be tightly related to the development of inclusive institutions that lower transaction costs and protect private property rights. Given the broad definition of capital, this naturally implies that both physical and human capital accumulation has to be correlated with high-quality institutions.

To test whether the above hypothesis is supported by the data, the study examines the partial relationships between institutional quality indices and physical and human capital variables. The results based on this exercise are shown in Figures 8-11.

Figure 8 and Figure 9 respectively depict the scatterplot of the share of gross capital formation and human capital index against the LSPR index for a sample of countries with relevant data. As shown below, the results are broadly in line with the institutions hypothesis. For instance, Figure 8 graphically demonstrates that the LSPR index and the rate of physical capital accumulation are closely related to each other. The analysis reveals that the pairwise correlation between these two variables is positive and relatively high (0.68). Also, the diagram shows that the slope

coefficient of the regression of gross capital formation on the LSPR index is significantly positive, implying that countries having stronger institutions tend to invest more in physical capital.

Figure 8: Scatterplot of Share of Gross Capital Formation and Legal System and Property Rights Index, 1960-2014

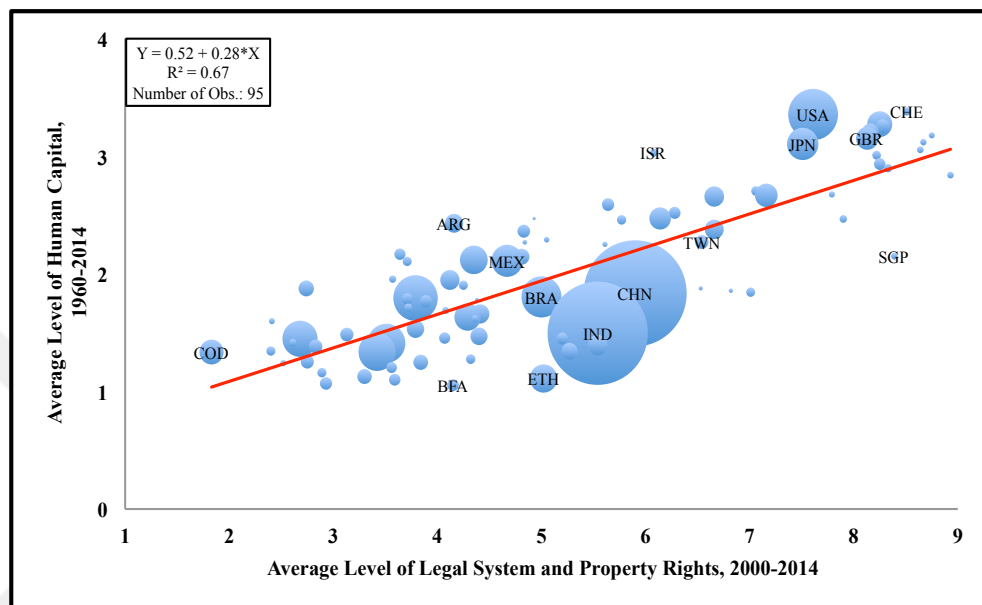


Source: Author's own calculations. Data on share of gross capital formation are from Penn World Table version 9.0. Data on legal system and property rights Index are from the Economic Freedom Dataset published by Fraser Institute.

Similarly, the results depicted in Figure 9 indicate that institutional development seems to be one of the promotive factors for human capital accumulation. As the diagram illustrates, the index of human capital tends to increase as the quality of economic institutions improves. Here, the simple correlation coefficient between human capital and the LSPR indices is estimated to be 0.82, which is even higher than the previous case. Moreover, the results based on a bivariate regression show that cross-country variations in the human capital index accord with that of the LSPR variable. As shown, the estimated regression line has a positive slope, and the coefficient of determination of the regression is very high (0.68), which together states that differences in human capital are highly correlated with variations in the quality of economic institutions. Overall, these results point out a possible connection between capital accumulation and institutions of property rights. But more importantly, the evidence implies that the answer to the question of

why some nations are more successful than others in accumulating physical and human capital might be related to the evolution of inclusive legal systems and incentive mechanisms.

Figure 9: Scatterplot of Human Capital and Legal System and Property Rights Index, 1960-2014

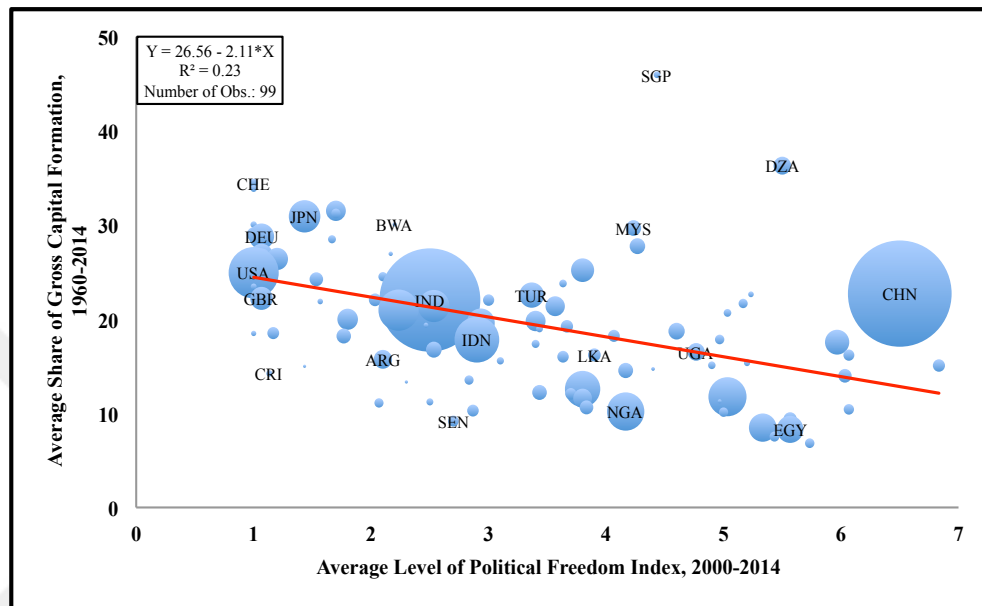


Source: Author's own calculations. Data on human capital are from Penn World Table version 9.0. Data on legal system and property rights index are from the Economic Freedom Dataset published by Fraser Institute.

To see how the process of capital accumulation is associated with political institutions, Figure 10 and Figure 11 repeat the same analysis using the POLFREE variable. As expected, the results are broadly similar to that of those relying on the LSPR index. For example, showing the partial relationship between the share of gross capital formation in GDP and the POLFREE index, Figure 10 provides support for the view that inclusive political institutions are conducive to capital accumulation. In this diagram, the negatively sloped regression line indicates that the rate of capital formation is higher in countries with relatively free political environments. For instance, the analysis reveals that most of the countries having an average freedom score of 1.0 have investment rates at around 25%. The United States, Switzerland, Australia, Denmark, and Germany are several countries belonging to this sub-group. Conversely, the data show that, excluding China, all countries with freedom scores of higher than 6.0 have also investment ratios lower

than 17%. Members of this group include Cameroon, Zimbabwe, the Syrian Arab Republic, and Chad, which, not surprisingly, today are among the poorest nations in the world in terms of both the capital stock and income per capita.

Figure 10: Scatterplot of Share of Gross Capital Formation and Political Freedom Index, 1960-2014

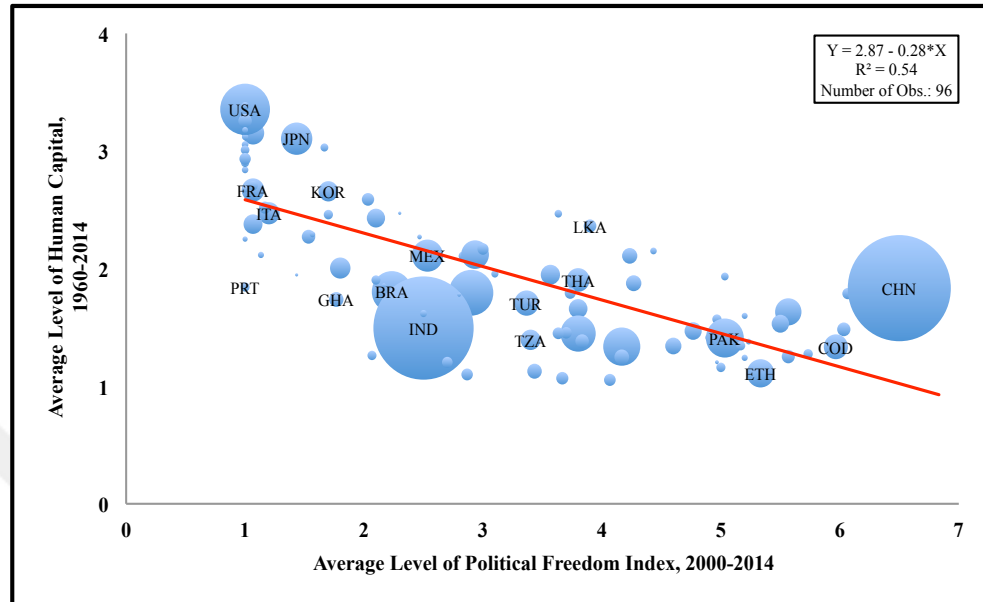


Source: Author's own calculations. Data on share of gross capital formation are from Penn World Table version 9.0. The political freedom index equals the average of civil liberties and political rights indices, for which the raw data are provided in the Freedom in the World (2019) report published by Freedom House.

Parallel to these results, the data also implies that the human capital accumulation is related to institutional development in the political field. As Figure 11 demonstrates, there is a positive relationship between the quality of political institutions and the human capital: the lower the POLFREE score, the higher the human capital index. The present analysis reveals that corresponding values for the coefficient of correlation and the R^2 of the regression of the measure of human capital on the POLFREE variable are 0.73 (in absolute value) and 0.54, indicating that variations in the human capital accumulation are closely connected with institutional differences in the political sphere. Also, the point estimate (-0.28) appearing in the diagram implies that, although it is a considerable task, reforming political institutions could raise human capital at a significant rate. Accordingly, the evidence below suggests that investing in political institutions might help countries

to narrow persistent gaps in income stemming from variations in the level of production and absorption capacity.

Figure 11: Scatterplot of Human Capital and Political Freedom Index, 1960-2014



Source: Author's own calculations. Data on human capital are from Penn World Table version 9.0. The political freedom index equals the average of civil liberties and political rights indices, for which the raw data are provided in the Freedom in the World (2019) report published by Freedom House.

To summarize, this section has sought to explore the relationship between institutions and economic prosperity using descriptive analyses. As presented above, the results relying on bivariate analysis broadly support the institutional hypothesis. In line with theoretical predictions, the evidence suggests that countries with better institutions tend to have higher income levels, show better growth performance, and accumulate more physical and human capital. Therefore, the main implication of the present analysis is that the economic progress seems to be more associated with democratic regimes and institutional arrangements protecting property rights rather than with absolutist regimes and extractive economic institutions.

On the other hand, none of these findings can be considered as the ultimate evidence for the direct impact of institutional factors on economic outcomes. As noted previously, the current analysis mostly relies on partial relations between institutional and economic variables, and naturally disregards several issues ranging from the endogeneity problem to the possible influence of omitted factors on results.

That implies that the evidence presented in this section is not sufficient to either confirm or reject the institutional hypothesis. As is well known, there is always a possibility that such results could represent a misleading or spurious relationship between economic indicators and institutions. Therefore, to be able to provide reliable and compelling evidence on the relationship between institutions and economic performance, it is necessary to use more formal methods that take these considerations into account. This is exactly the approach followed in the next section. In order to control the likely endogeneity problem between economic and institutional variables and consider the impact of factors other than institutions on economic performance, the following section runs a series of regressions that intend to ascertain the consequences of institutional differences. The details are as follows.

3.3. REGRESSION RESULTS

In section two, the study focused solely on partial correlations between key variables of interest to highlight the empirical links between institutional arrangements and economic variables. This section aims to provide more reliable evidence on the role of institutions by using formal regression analyses. Accordingly, several different estimation methods, from cross-sectional regressions to panel data analysis, have been employed to measure the effect of institutions and other variables on economic performance. Hence, the following lines are devoted to present the results and implications of these estimations.

3.3.1. Cross-Sectional Regressions

The core specifications considered in this section are derived from the growth models introduced in the preceding chapter. As shown in chapter two, the theoretical models have suggested two regression equations that reveal the main determinants of income per capita and economic growth, respectively. In a form suitable for the cross-sectional analysis, these regressions can be represented by the following equations:

$$(54) \quad \ln y_i = \mu_y + \beta_y \ln q_i + \mathbf{Z}'_i \theta_y + \epsilon_{y,i},$$

$$(55) \quad g_i = \mu_g + \beta_g \ln q_i + \mathbf{W}'_i \theta_g + \epsilon_{g,i},$$

where y_i and g_i are respectively the steady-state level of income per capita and the rate of per capita income growth in country i , q_i is a measure of institutional quality, $\mathbf{Z}'_i$ is a vector of exogenous variables included in the income equation, $\mathbf{W}'_i$ is a vector of exogenous variables included in the growth equation, and $\epsilon_{y,i}$ and $\epsilon_{g,i}$ are the respective random error terms. Verbally, equations (54) and (55) state that economic prosperity and income growth are dependent on institutional factors and a set of predetermined variables. This means that, when the relevant data are available, these equations can be used to predict differences in income levels and growth rates across countries.

In order to estimate these equations, the study resorts to data on the following variables. As measures of economic performance, the analysis again uses average GDP per capita over 1960-2014 and average growth rate of income per capita over the same period, for which the necessary data come from PWT version 9.0. In estimating the income and growth regressions above, these two measures constitute the set of dependent variables of the analysis.

With the aim of capturing institutional differences across countries, the study utilizes two alternative variables that are used previously in the descriptive analysis: the LSPR index (from Fraser Institute) and the POLFREE index (from Freedom House). As before, these variables are defined as averages over 2000-2014. Also, both LSPR and POLFREE variables are scaled to values between 0 and 1 for ease of interpretation. Thus, the estimations below can be used to assess the relative impacts of different institutions on economic performance. Given the definitions above, this strategy will help shed light on the question of which type of institutions, the political or the economic ones, are of primary importance to the economic development process.

As shown in equations (54) and (55), several other variables beyond institutions are considered in income and growth regressions to control for country-specific effects. Since each theoretical model suggests different sets of exogenous variables to be included in regressions, the analysis below will employ different

specifications and regressors in each time. That is, the variables included in $\mathbf{Z}'_i$ and $\mathbf{W}'_i$ will vary with the theoretical model under consideration. For instance, in regressions regarding the first model, $\mathbf{Z}'_i$ will consist of the investment rate, the effective depreciation rate, and a measure of cultural characteristics, while $\mathbf{W}'_i$ will include the initial income level along with the variables considered in $\mathbf{Z}'_i$. In specifications regarding the second model, however, both $\mathbf{Z}'_i$ and $\mathbf{W}'_i$ will be formed in a way to include a proxy for tax rates, in lieu of the culture variable, together with other covariates.

The relevant data used to measure each of these variables come from three different datasets. For instance, the data on traditional Solovian variables, namely the investment rate, the effective depreciation rate, and the initial income level, are obtained from PWT version 9.0. Among these variables, the investment rate is measured as the share of capital formation, which has been found to be associated positively with the level and growth rate of income in several studies (Mankiw et al., 1992; Esfahani and Ramirez, 2003). Besides this, the effective depreciation rate, which consists of the growth rate of effective labor ($x + n$) and the depreciation rate of capital, is computed as the sum of period averages of population growth, depreciation rate, and a constant rate of technological progress²². Lastly, the analysis uses log GDP per capita in 1960 in growth regressions to capture the effect of the initial level of income on the growth performance of countries in subsequent years.

The variable used to reflect cultural features of societies is the historical index of ethnic fractionalization (HIEF) provided by Harvard Dataverse (Drazanova, 2019). Recall that the first growth model developed in chapter two showed that countries having positive characteristics would have better economic performance due to lower transaction and information costs. Reading this in reverse, the reason why some countries have shown poor economic performance over time might be

²² The rate of technological progress is assumed to be 2% for all countries over the period 1960-2014. This assumption is compatible with the traditions followed in the empirical growth literature. For instance, while performing their estimations, Mankiw et al. (1992) and Islam (1995) assumed the depreciation rate plus the rate of technological progress, $(x + \delta)$, to be equal to 5%. As PWT 9.0 provides reliable estimates on depreciation rate, the current analysis computes the average rate of depreciation from this data and assigns a lower but reasonable rate to technological progress. Also, the assumed rate of technological progress is approximately equal to the average growth rate of the U.S. economy (2.02%). Since the U.S. is one of the leading countries in technological progress, the assumption above can be viewed as a safe bet.

unfavorable traits of their society that increase the cost of doing business and hinder economic progress. In the literature, several studies point to the degree of social heterogeneity as one of the factors likely to affect the level of transaction costs, institutional efficiency, and economic performance (Easterly and Levine, 2003; Mauro, 1995). Since HIEF basically measures the probability that two randomly chosen people within a given country are members of different ethnic groups, it is a direct indicator of the level of social diversity (Drazanova, 2020: 1-3). Accordingly, this study uses the ethnic fractionalization index, averaged over 1960 to 2013, as a proxy for the cultural heterogeneity to control for country-specific factors. Due to the fact that higher values in this index indicate higher levels of ethnic fractionalization, the theoretical expectation is that this variable would be negatively correlated with the income level and the growth rate.

The last variable considered in the set of exogenous regressors is the top marginal tax rate index (TAXIN), for which the raw data are collected from Fraser Institute's Economic Freedom Dataset. Briefly, TAXIN relies on information on the top marginal income and payroll tax rate and the level of income threshold by which these rates become effective (Gwartney et al., 2019b: 226). Analogous to the LSPR index, the index values vary from 0 to 10, with higher scores indicating lower tax rates (or the tax burden on individuals). The main reason for choosing TAXIN as a proxy for tax rates is that this index does not consider only the raw data on tax rates but also the impact of these rates on society. Also, given the lack of reliable and comparable estimates on tax rates across countries, Fraser Institute's tax index appears as a good indicator in the sense that it provides consistent data for a large number of countries. In estimating regressions, this variable is scaled to take values between 0 and 1 and used as averages. As the theory does not imply any particular direction regarding the impact of taxes on economic performance, the sign of the coefficient on this variable is unclear prior to estimations. This means that the following analysis is of particular importance to reveal whether the presence of the government and the tax rates are beneficial or detrimental to economic development.

The methodology followed to estimate equations (54) and (55) consists of two steps. In the first step, the analysis applies the OLS procedure to predict the parameters of the models. Accordingly, each of the growth and income equation

above will be successively estimated for two different models proposed by the theory. But for obvious reasons, this method will be used solely to get some intuitive feel for the relationships between variables, rather than obtaining final results. As noted earlier, the likely correlation between institutions and the stochastic error term in these regressions could lead OLS estimators to be biased and inconsistent. Therefore, one should use an alternative procedure that controls for the endogeneity bias and produces reliable estimates of the true population parameters.

The most common strategy used in the literature to correct for endogeneity problem is to apply the 2SLS (two-stage least squares) method that relies on the instrumental variable approach (Acemoglu et al., 2001; Acemoglu et al., 2002; Easterly and Levine, 2003; Emerson, 2003; Hall and Jones, 1999; Mauro, 1995; Rodrik et al., 2004). Following the literature, this section employs the 2SLS procedure to conduct the second part of the analysis. Basically, this approach hinges on the assumption that, given the existence of a “good” proxy that eliminates the income effect embedded in institutional variables, 2SLS estimators would be unbiased and consistent. Thus, in estimating regressions above, the main problem would turn out to finding such proxies. Although options are relatively scant, previous studies have suggested several candidates that can be used as an instrument for institutions. For instance, Acemoglu et al. (2001) have argued that data on settler mortality rates in the colonization era are useful for capturing exogenous variations in institutions among countries. The rationale behind their hypothesis is that the suitability of the disease environment was the main determinant of the way of how Europeans had formulated the institutional matrix in ex-colonies: when the disease environment let them settle in large numbers, colonizers developed high-quality institutions that support productive activities. Per contra, when the endemic conditions were not suitable for them, they formed low-quality institutions that focus solely on resource extraction and plunder. Hence, the authors asserted that since there is no theoretical reason relating economic performance today directly to European mortality rates in the distant past, the settler mortality rates would then be a valid proxy for exogenous variations in current institutions.

Based on the same grounds, this study employs settler mortality rates compiled by Acemoglu et al. (2000) as an instrument for institutional quality.

However, one problem with using this variable is that the low sample size that it brings along. As the data on mortality rates are available only for ex-colonies, the number of observations in the current dataset drops from about a hundred to sixty-three. Also, due to the fact that most European countries (e.g., Belgium, Germany, and Spain), as well as several countries that were not colonized (e.g., Turkey and China), fall from the sample once the mortality rates are employed, the dataset at hand loses its ability to represent the world as a whole.

In considering these facts above, this thesis develops an alternative measure of institutional quality that relies on linguistic data to increase the sample size and check the robustness of the results based on the mortality rates. Following the literature that links the fraction of speaking European languages in society to institutional development (see, for example, Rodrik et al., 2004; Dreher et al., 2014; Hall and Jones, 1999), the analysis here uses the average probability of speaking the common language with six European countries, France, Germany, Italy, Portugal, Spain, and the United Kingdom, as a proxy for the institutional legacy of European forces. Essentially, this variable is employed to measure the Western influence on cultural practices, which is likely to be correlated with the type and quality of institutional arrangements that countries have developed over time. The raw data on the common spoken language (CSL) index is obtained from the CEPIL database (Melitz and Toubal, 2012; Melitz, and Toubal, 2014). In large measure, the index resembles the settler mortality rates²³ and seems to be a reasonable alternative as an instrument for institutional quality²⁴. Also, since data on linguistic measures are available for most countries that are missing in the sample of mortality rates, the constructed CSL index increases the sample size in a respectable amount (from 63 to over 90). Based on these facts, the present analysis considers this variable alternately as a determinant in the first stage regressions of institutions.

Besides these variables, some studies in the literature have pointed to the role of education, or more specifically, human capital, in the process of institutional development (Dias and Tebaldi, 2012; Glaeser et al., 2004; Sokoloff and Engerman,

²³ The correlation coefficient between log settler mortality rates (LNSETM) and log common spoken language index (LNCSL) is -0.47 for 61 countries for which data are available.

²⁴ The pairwise correlations between LNCSL and measures of institutional quality are 0.44 (for LNLSPR, 89 countries) and -0.63 (for LNPOLFREE, 91 countries), respectively.

2000). For instance, using a theoretical model, Dias and Tebaldi (2012) showed that institutional quality is structurally dependent on the share of educated labor in the economy. Empirically, Glaeser et al. (2004: 296-298) demonstrated that initial levels of education are good predictors of institutions, while the reverse is not correct. In accordance with these arguments, this study utilizes data on the human capital index in 1960 (from PWT version 9.0) as an additional regressor in the first stage equations of institutional quality. The main objective here is to account for institutional differences stemming from variations in initial levels of human capital across countries, thus providing better predictions for institutional variables.

In the light of the discussions above, the study estimates the following first-stage regressions in which the institutional variables are defined as a function of several instrumental variables along with other predetermined factors considered in income and growth equations:

$$(56) \quad \ln q_i = a_y + b_y \ln \varphi_i + b_y \ln h_i + \mathbf{Z}'_i c_y + \varepsilon_{y,i},$$

$$(57) \quad \ln q_i = a_g + b_g \ln \varphi_i + b_g \ln h_i + \mathbf{W}'_i c_g + \varepsilon_{g,i},$$

where (56) and (57) are the corresponding first-stage regressions for income and growth models above. In these equations, q_i refers the quality of institutions in country i , φ_i denotes the first instrumental variable used to control for European influence on institutions (which is measured by either settler mortality rates, SETM, or the common spoken language index, CSL), h_i stands for the initial level of human capital index, and $\mathbf{Z}'_i$ and $\mathbf{W}'_i$ are respectively the vectors of control variables in the income and growth equations, and $\varepsilon_{y,g}$ is the corresponding disturbance term.

Together, equations (54)-(57) constitute the regression system that the 2SLS method is applied. As stated above, the present analysis treats institutions as endogenous variables and uses the predicted values derived from equations (56) and (57), in turn, to estimate the impact of institutions on income levels and growth rates. Given the instrumental variables used in the first-stage equations, this strategy is expected to help solve simultaneity bias and provide reliable results regarding the effect of institutions.

In the analysis, all variables except growth rates are used in logs, as implied by the theoretical analysis. The list of variables, their definitions, and the corresponding summary statistics are presented in Table 3. The rest of the section is devoted to discussing results based on OLS and 2SLS estimates.

Table 3: Descriptive Statistics of Regression Variables

	Mean	Standard Deviation	Number of Observation
LNRGDP (Log of average GDP per capita (PPP), 1960-2014)	8.5444	1.1598	99
RGDPGR (Average annual growth rate of GDP per capita (PPP), 1960-2014)	0.0188	0.0143	99
LNLSPR (Log of legal system and property rights index, 2000-2014)	-0.7219	0.3745	97
LNPFREE (Log of political freedom index, 2000-2014)	-0.9803	0.6214	99
LNRGDP60 (Log GDP per capita (PPP) in 1960)	8.0534	1.0038	99
LNS (Log of average share of gross capital formation, 1960-2014)	-1.6830	0.3926	99
LNEFDEP (Log of average effective depreciation rate ($x + n + \delta$), 1960-2014)	-2.4857	0.1419	99
LNETHFR (Log of ethnic fractionalization index, 1960-2013)	-1.1556	1.0257	94
LNTAXIN (Log of top marginal tax rate index, 2000-2014)	-0.6106	0.4684	99
LNSETM (Log European settler mortality)	4.6271	1.2784	63
LNCSL (Log of average probability of speaking the common language with six European countries)	-2.0437	1.2138	91
LNHC60 (Log of Human capital index in 1960)	-0.9908	0.3159	96

Notes: LNRGDP is the log of average GDP per capita for the period 1960-2014 and is calculated using the RGDP^e and population data provided by the Penn World Table (PWT) version 9.0. RGDPGR is the average annual growth rate of GDP per capita over the 1960-2014 period, which is computed based on the RGDP^{NA} data from PWT version 9.0, as before. LNLSPR is the log of the legal system and property rights (LSPR) index, averaged over 2000 to 2014. Data on the LSPR index are from the Economic Freedom Dataset published by Fraser Institute. LSPR is originally measured on a scale from 0 to 10, where higher scores correspond to better institutional structures regarding the legal system and private property rights. LNPFREE is the log of the average political freedom index over the period 2000-2014. POLFREE equals the average of civil liberties and political rights indices, for which the raw data are provided in the Freedom in the World (2019) report published by Freedom House. POLFREE is a seven-scale index from 1 to 7, with lower scores means more democracy or better political institutions. LNRGDP60 is the log GDP per capita (PPP) in 1960, which is computed based on the RGDP^{NA} data from PWT version 9.0. LNS and LNEFDEP are logs of the share of gross capital formation in GDP and effective depreciation rate, respectively. Both LNS

and LNEFDEP are averages for the period 1960-2014. EFDEP is the sum of three variables, population growth, depreciation rate, and rate of technological progress (which is assumed to be 0.02), for which the raw data come from PWT version 9.0. LNETHFR is the log of the ethnic fractionalization index, averaged over 1960-2013. The data on ETHFR are from the Historical Index of Ethnic Fractionalization Dataset (HIEF) provided by Harvard Dataverse. ETHFR is the probability that a pair of people chosen randomly within a given country is members of different ethnic groups. The index ranges between 0 and 1, with higher values indicating higher levels of ethnic fractionalization. LNTAXIN is the log of the top marginal tax rate index (2000-2014) provided by the Economic Freedom Dataset (Fraser Institute). Similar to the LSPR index, TAXIN ranges from 0 to 10, with higher values meaning lower tax rates (or, lower levels of tax burden). LNSETM is the log European settler mortality (deaths per annum per 1,000 mean strengths), compiled by Acemoglu et al. (2000). LNCSL is the log of the average probability of speaking the common language with six European countries, France, Germany, Italy, Portugal, Spain, and the United Kingdom. The raw data on CSL, which is collected from CEPII Database, range between 0 and 1, with 1 indicating the highest probability level. In this study, CSL is defined as the average probability that a person randomly chosen within a given country understands the languages spoken in the reference countries mentioned above. LNH60 is the log of the human capital index in 1960, from the PWT Edition 9.0. LSPR, POLFREE, TAXIN, and HC60 are scaled to values between 0 and 1 before taking logs.

Tables 4 and 5 show the estimation results for the regressions of income levels on institutions and several control variables. In these tables, columns (1)-(3) report results for models where institutions are the only explanatory variable, while columns (4)-(9) show regression outcomes regarding the theoretical models. Clearly, the evidence presented in these tables confirms that institutional framework is one of the fundamental determinants of economic prosperity. In all the regressions below, estimated coefficients on institutional variables are significant at the 1% level and have the expected signs. For instance, results demonstrated in Table 4 suggest that countries with better institutions of private property rights and legal systems have higher income levels. Similarly, all the estimates in Table 5 show that inclusive political institutions (denoted by lower POLFREE scores) are associated with higher levels of per capita GDP. Under the assumption that LSPR and POLFREE are good proxies for institutional structures, these results imply that both economic and political institutions do matter for economic development. On the other hand, the estimations reveal that improvements in economic institutions are more rewarding than that of political institutions. As the corresponding coefficients indicate, increases in the LSPR index bring at least 0.58 log-points higher income than the

same level of improvements in the POLFREE index²⁵. This finding implies that, compared to those on political processes, regulations on the economic sphere have been playing a more prominent role in promoting economic development.

In addition to these findings, both OLS and 2SLS estimates show that in most regressions, the coefficients on institutional variables are larger in magnitude compared to that of other variables, providing further support for the view that origins of economic prosperity are mainly related to institutional development, rather than other factors. Also, the results affirm the main conclusion of the correlation analysis that variations in institutional quality help explain a substantial portion of the differences in income levels among countries. For instance, even in the scrumpy models shown in columns (1), the R^2 values of the regressions imply that approximately 60% of the variations in income levels can be predicted by differences in institutional structures, independent of the variable used to measure institutional quality.

Tables 4 and 5 show that several variables other than institutions are influential over income levels as well. For instance, columns (4)-(9) report that the coefficient on physical capital investment, LNS, is significantly positive in most regressions, suggesting that higher rates of investments tend to bring higher prosperity, as declared by the Solow growth model. More importantly, the estimated size of the coefficient on this variable implies that if improvements in institutional quality are supported by high saving rates, countries could gain substantial rewards in terms of welfare. In most regressions below, LNS has a relatively high coefficient compared to other variables except institutions, which clearly highlights the notable role played by physical capital in fostering economic progress. Hence, the evidence from cross-country regressions seems to be compatible with the theoretical analysis that considers institutional development and capital accumulation as key determinants of economic development.

²⁵ Consider the respective coefficient estimates in column (4) in each table. In absolute terms, the difference between coefficient estimates on LNLSPP and LNPOLFREE is 0.5836 (1.5671 – 0.9835). Note that this difference increases up to 1.42 (column (3)) in different specifications.

Table 4: GDP Per Capita and Legal System and Property Rights Index: OLS and 2SLS Estimates

Dependent Variable is log of average GDP per capita (LNRGDP), 1960-2014

	OLS	2SLS		OLS 1	2SLS 1		OLS 2	2SLS 2	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
C	10.3487 *** (0.1263)	11.0565 *** (0.2321)	11.0050 *** (0.1317)	9.1521 *** (1.1590)	10.2760 *** (1.9344)	9.5586 *** (1.3260)	9.1706 *** (1.1673)	9.8905 *** (1.9363)	9.6505 *** (1.4575)
LNLSPR	2.4690 *** (0.1720)	3.2919 *** (0.3256)	3.3194 *** (0.2339)	1.5671 *** (0.2263)	2.6889 *** (0.3938)	2.7014 *** (0.3787)	1.6531 *** (0.2087)	2.8386 *** (0.4083)	2.7940 *** (0.4083)
LNS				1.1130 *** (0.2204)	0.7300 * (0.3763)	0.4879 (0.3272)	1.1209 *** (0.2283)	0.5824 (0.3853)	0.4392 (0.3497)
LNEFDEP				-0.9313 ** (0.4195)	-0.6170 (0.6781)	-0.7397 (0.4579)	-0.9554 ** (0.4321)	-0.7026 (0.3064)	-0.6814 (0.5344)
LNETHFR				-0.0860 * (0.0519)	-0.0821 (0.0857)	0.0037 (0.0555)			
LNTAXIN							-0.1356 (0.0851)	-0.1772 (0.4447)	-0.0203 (0.1408)
Number of Observations	97	60	87	92	56	82	97	60	87
R-squared	0.63	0.36	0.59	0.76	0.55	0.70	0.75	0.52	0.69
J-stat. (p-value)	-	0.1485	0.0002	-	0.1962	0.0001	-	0.1467	0.0002
Cragg-Donald Wald F-stat.	-	39.61 ^a	68.21 ^a	-	25.57 ^a	27.33 ^a	-	25.96 ^a	29.79 ^a
Instrumental Variables	-	LNSETM LNHC60	LNCSL LNHC60	-	LNSETM LNHC60	LNCSL LNHC60	-	LNSETM LNHC60	LNCSL LNHC60
First Stage F-stat.	-	39.61	68.21	-	13.55	27.96	-	15.76	29.96

Notes: Columns (1)-(3) show regressions in which LNLSPR is the only independent variable. Columns (4)-(6) show estimations for Model 1, whereas columns (7)-(9) show estimations for Model 2. LSPR and HC60 are scaled to values between 0 and 1. All regressors are in logs. Values reported under coefficient estimates are White heteroskedasticity-consistent (robust) standard errors. "a" refers to values higher than Stock-Yogo weak ID test critical values (size) at 10 percent. ***, **, * denote significance at the 1, 5, and 10 percent level, respectively.

Table 5: GDP Per Capita and Political Freedom Index: OLS and 2SLS Estimates

Dependent Variable is log of average GDP per capita (LNRGDP), 1960-2014

	OLS	2SLS		OLS 1	2SLS 1		OLS 2	2SLS 2	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
C	7.1415 *** (0.1467)	6.7342 *** (0.2122)	6.7120 *** (0.1954)	10.2896 *** (1.1932)	13.4503 *** (1.9858)	12.8593 *** (1.4855)	10.1766 *** (1.2148)	13.2967 *** (2.0191)	12.5921 *** (0.5169)
LNPOLFREE	-1.4312 *** (0.0980)	-1.8737 *** (0.1788)	-1.8986 *** (0.1324)	-0.9835 *** (0.1118)	-1.5447 *** (0.2099)	-1.4653 *** (1.1772)	-0.9685 *** (0.1117)	-1.6602 *** (0.2341)	-1.6001 *** (0.2007)
LNS				1.2502 *** (0.2014)	1.1704 *** (0.2986)	1.1619 *** (0.2593)	1.3749 *** (0.2037)	1.0894 *** (0.3177)	1.1878 *** (0.2747)
LNEFDEP				0.3041 (0.4603)	1.8388 ** (0.7775)	1.5864 *** (0.5977)	0.1195 (0.4823)	1.7688 ** (0.8045)	1.4041 ** (0.6189)
LNETHFR				-0.1343 ** (0.0623)	-0.1592 (0.1061)	-0.1477 ** (0.0411)			
LNTAXIN							-0.0482 (0.0992)	0.1971 (0.4378)	0.1685 (0.1457)
Number of Observations	99	61	88	94	57	83	99	61	88
R-squared	0.59	0.33	0.49	0.78	0.63	0.75	0.74	0.55	0.68
J-stat. (p-value)	-	0.0071	0.9005	-	0.0628	0.0915	-	0.0542	0.4670
Cragg-Donald Wald F-stat.	-	59.98 ^a	111.66 ^a	-	46.72 ^a	61.16 ^a	-	40.06 ^a	56.03 ^a
Instrumental Variables	-	LNSETM LNHC60	LNCSL LNHC60	-	LNSETM LNHC60	LNCSL LNHC60	-	LNSETM LNHC60	LNCSL LNHC60
First Stage F-stat.	-	59.98	111.66	-	26.83	51.28	-	25.13	50.51

Notes: Columns (1)-(3) show regressions in which LNPOLFREE is the only independent variable. Columns (4)-(6) show estimations for Model 1, whereas columns (7)-(9) show estimations for Model 2. POLFREE and HC60 are scaled to values between 0 and 1. All regressors are in logs. Values reported under coefficient estimates are White heteroskedasticity-consistent (robust) standard errors. “a” refers to values higher than Stock-Yogo weak ID test critical values (size) at 10 percent. ***, **, * denote significance at the 1, 5, and 10 percent level, respectively.

Besides these results, the evidence presented in columns (4)-(6) provides some support for the view that the cultural characteristics of countries could affect economic outcomes. In half of the regressions above, the ethnic fractionalization variable, LNETHFR, is found negatively related to income levels at conventional significance rates, suggesting that cultural fragmentation is detrimental to development. The basic implication of this finding is that, to some extent, country-specific factors regarding ethnic diversity could explain the variation in income levels among a group of countries having similar institutional structures and saving rates. In this respect, the results above seem to be in line with the first model proposed in this thesis.

On the other hand, the regression analysis reported mixed results on the relationship between effective depreciation rate and income. As the numbers in the tables show, the sign, significance, and the size of the coefficient on LNEFDEP vary substantially across different specifications. Thus, results do not seem to be decisive regarding the impact of the effective depreciation rate on income levels. Indeed, the present analysis shows that this variable has a noisy nature, and there is no systematic relationship between economic prosperity and the effective depreciation rate of capital.

Finally, columns (7)-(9) show that, once the other factors are taken into account, tax rates do not have any particular role in determining income levels. In none of the estimations above, the results point to a statistically significant impact of tax rates on GDP per capita. Yet, this finding does not mean that taxes are of no importance at all. Instead, the results seem to indicate that there could be a balance between positive and negative effects of taxes on the economy, as the theory revealed before.

For a number of reasons, the estimation results appearing above point to a consistent and robust relationship between institutions and economic development. Firstly, the analysis shows that the sign and significance of the coefficients on institutional variables do not vary across different models. Regardless of the variables included in the regression equation, institutions are found to have significant and positive impacts on income levels. Moreover, the corresponding coefficients on LSPR and POLFREE show remarkably little variation when the set of

instruments and other predetermined variables included in the first-stage regressions have changed²⁶. For instance, results based on the 2SLS method reveal that the coefficient on LSPR ranges between 2.69 (column (5)) to 2.84 (column (7)) across four regression models that control for other factors. Similarly, the variation in the coefficient on POLFREE is lower than 15% across the mentioned models. These findings suggest that estimates on the impact of institutional variables are consistent and reliable. Secondly, results show that, in all cases, the estimated coefficient on institutional variables increases when the analysis resorts to the 2SLS method in lieu of the OLS. This pattern indicates that, once the measurement errors and endogeneity problems are taken care of, the effect of institutions on income levels becomes more pronounced, which is in line with the results reported by earlier studies (see, for example, Acemoglu et al., 2001; Rodrik et al., 2004). Lastly, Tables 4 and 5 show that the instrumentation strategy considered in the regressions is valid in the sense that none of the models above suffer from the weak instruments problem. That means that the results presented so far are sensible in both economic and econometric terms.

The estimation results for growth equations are shown in Tables 6 and 7. Once again, the results appearing in these tables suggest that the data at hand are largely consistent with the theoretical models developed in chapter two. For instance, the regressions below show that institutions have a notable impact on growth performance, as presumed by the formal models. In all estimations, institutional variables, LSPR and POLFREE, enter into regressions with expected signs, and their respective coefficients are significant at the 1% level. These findings confirm the argument that institutions are significant predictors of variations in growth rates across countries and could thus explain the observed patterns in the global income distribution over the last few decades. Moreover, the analysis shows that corresponding coefficients on institutional variables are relatively stable and show remarkably little variation from one model to another. For example, Table 6 demonstrates that the coefficient on the LSPR variable is around 0.0250 in 8 out of 9 regressions. Similarly, the estimated coefficients on the POLFREE variable range between -0.0113 and -0.0182 in six of the regressions that include other control

²⁶ See Appendix Tables 3-4 for detailed results on the corresponding first-stage regressions.

variables. These results imply that the proposed relationship between institutions and income growth is reliable in the sense that it holds across different models and estimation methods.

Although the present analysis points to the importance of both measures of institutions to support economic performance, the comparison of the size of the respective coefficients on the LSPR and POLFREE variables reveals that economic and political institutions have relatively different impacts on growth rates. For instance, in all the estimations below, the LSPR variable is found to have a higher coefficient (in absolute terms) than the POLFREE variable. This finding again indicates the primacy of economic arrangements over political institutions in promoting economic performance: secure property rights and effective legal systems seem to have more contribution than enlarged political freedoms to trigger “right” incentives and behaviors that foster productive activities. Hence, the results imply that once the economic arrangements are disregarded, political institutions might have relatively mild effects on economic performance. Accordingly, the analysis below appears to provide a partial explanation for the previously mentioned fact that why a set of countries with similar POLFREE scores might have significantly different growth rates.

Columns (4)-(9) show that several other variables are correlated with income growth, as well. For instance, both the OLS and 2SLS estimates reveal that the log of initial income level, LNRGDP60, has a significantly negative impact on the growth rate of per capita output. As shown, the estimated coefficient is statistically significant at least at the 5% level and varies between -0.0050 (column (8) in Table 6) to -0.0101 (column (6) in Table 7). These figures suggest that having a twice as high initial income level will reduce the average annual growth rate by 0.35-0.70%, depending on the specification. Accordingly, the results below provide strong evidence for the conditional convergence hypothesis proposed by the institutions-augmented growth models: over a given period of time, countries initially having lower incomes will record higher growth rates than others with relatively higher initial income levels. However, as the definition of conditional convergence implies, this does not mean that all countries in the sample will reach a standard income level in time because of the mentioned difference in growth rates. Instead, what these

results indicate is that there will be a tendency toward income convergence only among a group of countries having similar characteristics. That is, convergence will only emerge after controlling for institutional quality, investment rates, population growth, and cultural diversity or tax structure. In this context, the analysis below seems to explain why some of the previous studies in the literature (i.e., Pritchett, 1997) that neglected country-specific factors, especially those related to institutions, have reported evidence against convergence.

Results in Tables 6-7 suggest that physical capital accumulation is also among the key determinants of economic performance. The analysis shows that regardless of the model and the estimation procedure, the coefficient on the share of capital formation is positive and statistically significant. This finding implies that higher saving rates seem to help countries achieve faster growth rates, as proposed by theoretical models. Also, the estimations below show that the magnitude of the coefficient on LNS is relatively large compared to that of other variables, indicating that capital formation has a prominent role in determining the growth path of income.

In addition to these findings, the regression results reveal several noteworthy implications regarding each of the theoretical models developed in the thesis. For instance, columns (4)-(6) show that the growth rate of income per capita correlates negatively with the ethnic fractionalization index, as suggested by the first growth model. The LNETHFR variable is found to be statistically significant in 5 out of 6 regressions. Also, the analysis shows that the size of the estimate remains relatively stable across different models and estimation methods. Therefore, the results below suggest that even after controlling for other factors, the pace of economic progress could show variations among societies having different heterogeneity levels. In particular, these findings support the idea that more fragmented countries that suffer more from ethnic conflicts and other problems (e.g., corruption, as Mauro (1995) stated) would likely show poor economic performance, as the theoretical analysis has proposed earlier.

Columns (7)-(9) explore the influence of taxation on economic growth. As the results suggest, the tax structure has non-negligible impacts on the growth rate. In all regressions, the coefficient on LNTAXIN is found to be positive and statistically significant at the 5% level. This finding implies that when other factors

are held constant, lower tax rates accelerate economic growth. Therefore, unlike the theoretical analysis indicating an ambiguity regarding the net effect of taxes on economic performance, the evidence from cross-sectional regressions suggests that the burden of taxes appears to outweigh its benefits. Thus, the results in Tables 6 and 7 strongly support the idea that countries that aim to grow faster should limit the degree of government intervention into the economy and design policies that do not undermine productive activities by creating disproportionate tax burdens.

Finally, the results based on growth regressions show that the effective depreciation rate does not affect income growth in a consistent way. The analysis reveals that the statistical significance and magnitude of the coefficient on LNEFDEP varies from model to model, similar to the results of income regressions. Hence, the evidence again indicates population growth and depreciation rate, taken together, do not seem to be correlated with the pace of economic progress.

Overall, the evidence presented in this section appears to be consistent with those implied by the descriptive analysis and corroborates the idea that institutional differences have critical consequences on countries' economic performance over the long-term. As the results revealed, both economic and political institutions have significant impacts on the level and growth rate of income per capita, even after controlling for saving rates, population growth, initial income levels, cultural differences, and tax structures. Of particular importance among the results is that these effects are robust to variations in model specification, instrumentation strategy, and the estimation method. In this regard, the empirical findings based on cross-sectional analysis seem to be reliable and consistent. Also, the results above appear to verify the main implications of the institutions-augmented growth models introduced in this thesis. Thus, the analysis in this section lays stress on the importance of institutional factors in understanding the economic development process and indicates once again that it is essential to integrate institutions into theoretical and empirical analysis to understand cross-country differences in prosperity and long-term economic growth.

Table 6: Economic Growth and Legal System and Property Rights Index: OLS and 2SLS Estimates

Dependent Variable is average annual growth rate of GDP per capita (RGDPGR), 1960-2014

	OLS	2SLS		OLS 1	2SLS 1		OLS 2	2SLS 2	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
C	0.0353 *** (0.0029)	0.0335 *** (0.0046)	0.0287 *** (0.0023)	0.1480 *** (0.0228)	0.1305 *** (0.0338)	0.1268 *** (0.0288)	0.1355 *** (0.0231)	0.1257 *** (0.0280)	0.1104 *** (0.0263)
LNLSPR	0.0223 *** (0.0034)	0.0211 *** (0.0052)	0.0148 *** (0.0034)	0.0257 *** (0.0044)	0.0287 *** (0.0071)	0.0250 *** (0.0068)	0.0276 *** (0.0042)	0.0279 *** (0.0061)	0.0272 *** (0.0064)
LNRGDP60				-0.0079 *** (0.0015)	-0.0056 ** (0.0024)	-0.0065 *** (0.0020)	-0.0075 *** (0.0014)	-0.0050 ** (0.0019)	-0.0064 *** (0.0017)
LNS				0.0117 *** (0.0035)	0.0077 ** (0.0038)	0.0091 ** (0.0041)	0.0117 *** (0.0036)	0.0068 * (0.0035)	0.0090 ** (0.0039)
LNEFDEP				0.0121 * (0.0070)	0.0140 (0.0115)	0.0102 (0.0080)	0.0056 (0.0070)	0.0121 (0.0104)	0.0010 (0.0073)
LNETHFR				-0.0026 ** (0.0011)	-0.0025 (0.0016)	-0.0021 * (0.0012)			
LNTAXIN							0.0041 ** (0.0020)	0.0090 ** (0.0034)	0.0057 *** (0.0020)
Number of Observations	97	60	87	92	56	82	97	60	87
R-squared	0.35	0.39	0.34	0.57	0.47	0.52	0.58	0.55	0.56
J-stat. (p-value)	-	0.0211	0.2173	-	0.4501	0.1214	-	0.2893	0.3616
Cragg-Donald Wald F-stat.	-	39.61 ^a	68.21 ^a	-	21.16 ^a	17.78 ^b	-	23.18 ^a	19.44 ^b
Instrumental Variables	-	LNSETM LNHC60	LNCSL LNHC60	-	LNSETM LNHC60	LNCSL LNHC60	-	LNSETM LNHC60	LNCSL LNHC60
First Stage F-stat.	-	39.61	68.21	-	12.59	23.12	-	15.10	24.78

Notes: Columns (1)-(3) show regressions in which LNLSPR is the only independent variable. Columns (4)-(6) show estimations for Model 1, whereas columns (7)-(9) show estimations for Model 2. LSPR and HC60 are scaled to values between 0 and 1. All regressors are in logs. Values reported under coefficient estimates are White heteroskedasticity-consistent (robust) standard errors. “a” and “b” respectively refer to values higher than Stock-Yogo weak ID test critical values (size) at 10 and 15 percent. ***, **, * denote significance at the 1, 5, and 10 percent level, respectively.

Table 7: Economic Growth and Political Freedom Index: OLS and 2SLS Estimates

Dependent Variable is average annual growth rate of GDP per capita (RGDPGR), 1960-2014

	OLS	2SLS		OLS 1	2SLS 1		OLS 2	2SLS 2	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
C	0.0118 *** (0.0028)	0.0092 ** (0.0036)	0.0103 *** (0.0030)	0.1660 *** (0.0257)	0.1859 *** (0.0561)	0.1935 *** (0.0456)	0.1461 *** (0.0277)	0.1673 *** (0.0434)	0.1642 *** (0.0391)
LNPOLFREE	-0.0071 *** (0.0020)	-0.0079 ** (0.0030)	-0.0076 *** (0.0022)	-0.0116 *** (0.0030)	-0.0182 *** (0.0063)	-0.0175 *** (0.0050)	-0.0113 *** (0.0030)	-0.0165 *** (0.0056)	-0.0182 *** (0.0050)
LNRGDP60				-0.0086 *** (0.0017)	-0.0088 ** (0.0037)	-0.0101 *** (0.0029)	-0.0075 *** (0.0016)	-0.0073 ** (0.0029)	-0.0092 *** (0.0023)
LNS				0.0189 *** (0.0042)	0.0159 ** (0.0064)	0.0184 *** (0.0055)	0.0205 *** (0.0041)	0.0146 *** (0.0053)	0.0191 *** (0.0052)
LNEFDEP				0.0249 *** (0.0093)	0.0371 ** (0.0169)	0.0341 ** (0.0132)	0.0161 (0.0104)	0.0304 ** (0.0150)	0.0212 * (0.0126)
LNETHFR				-0.0038 *** (0.0013)	-0.0039 * (0.0024)	-0.0040 ** (0.0016)			
LNTAXIN							0.0051 ** (0.0025)	0.0122 ** (0.0050)	0.0075 ** (0.0029)
Number of Observations	99	61	88	94	57	83	99	61	88
R-squared	0.10	0.05	0.07	0.46	0.18	0.27	0.42	0.25	0.24
J-stat. (p-value)	-	0.0007	0.1018	-	0.0109	0.5713	-	0.0029	0.6334
Cragg-Donald Wald F-stat.	-	59.98 ^a	111.66 ^a	-	17.36 ^b	23.19 ^a	-	15.67 ^b	23.17 ^a
Instrumental Variables	-	LNSETM LNHC60	LNCSL LNHC60	-	LNSETM LNHC60	LNCSL LNHC60	-	LNSETM LNHC60	LNCSL LNHC60
First Stage F-stat.	-	59.98	111.66	-	22.08	42.83	-	20.57	41.74

Notes: Columns (1)-(3) show regressions in which LNLSPR is the only independent variable. Columns (4)-(6) show estimations for Model 1, whereas columns (7)-(9) show estimations for Model 2. LSPR and HC60 are scaled to values between 0 and 1. All regressors are in logs. Values reported under coefficient estimates are White heteroskedasticity-consistent (robust) standard errors. “a” and “b” respectively refer to values higher than Stock-Yogo weak ID test critical values (size) at 10 and 15 percent. ***, **, * denote significance at the 1, 5, and 10 percent level, respectively.

3.3.2. Panel Data Regressions

In the previous section, the study utilized cross-sectional regressions to evaluate the long-term relationships between economic performance, institutions, and a set of variables proposed by the theoretical models. In broad terms, the results from these analyses seem to be in line with the theoretical predictions and give support to the hypothesis that institutional factors have notable impacts on both income levels and growth rates. However, the evidence from these regressions should be evaluated by care since analyses relying on the cross-sectional framework are generally subject to various limitations on both theoretical and empirical dimensions, regardless of the effort made to perform them appropriately. For instance, one major problem with this type of analysis stems from the implicit assumptions that countries have homogenous/similar production technologies and that explanatory variables included in the model are independent of factors shaping these technologies. Several studies in the literature have stated explicitly that these are highly restrictive and strong assumptions that might affect the reliability and robustness of parameter estimates (Durlauf et al., 2004: 105; Islam, 1995: 1127-1140; Lee et al., 1998: 907). For example, Islam (1995) noted that, within the Solovian framework, growth rates and income levels appear respectively as a function of a productivity parameter that is likely to vary across economies. Accordingly, he asserted that cross-sectional regressions inclined to neglect such variations in this term would be misleading due to the possible omitted variable problem that would bias parameter estimates. Thus, he argued that rather than relying on cross-sectional regressions, one should use a panel data framework that allows for incorporating country-specific effects into the analysis to obtain much more reliable estimates of parameters.

Along the same lines, Durlauf et al. (2004) mentioned that, in contrast to the cross-sectional analysis that controls for only a part of observed differences across economies, panel data analysis, which accounts for unobserved heterogeneity, is more suitable for growth studies. They also emphasized that the panel data approach, by its nature, provides a richer content to study the empirics of growth, compared to that of time-series or cross-sectional analyses, as it allows for capturing variability in

both dimensions and improves the sample size considerable, together which would boost the robustness of the results.

Following these discussions, this section is devoted to performing empirical analyzes based on panel data models that incorporate unobserved country-specific factors neglected by previous analyses. The central motivation here is to examine whether the inclusion of cross-country heterogeneity into the analysis will alter the results provided by cross-sectional regressions. Accordingly, the income and growth equations derived from theoretical models are transformed into the following regression forms compatible with the panel data framework that allows for cross-sectional heterogeneity:

$$(58) \quad \ln y_{it} = \eta_{y,i} + \beta_y \ln q_{it} + \mathbf{Z}'_{it} \theta_y + \epsilon_{y,it},$$

$$(59) \quad g_{it} = \eta_{g,i} + \beta_g \ln q_{it} + \mathbf{W}'_{it} \theta_g + \epsilon_{g,it},$$

where $\eta_{y,i}$ and $\eta_{g,i}$ are parameters controlling for unobserved country-specific factors in income and growth regressions, respectively. As one can easily notice, equations (58) and (59) are the panel versions of the corresponding cross-section regressions (54) and (55). The only difference between these two sets of equations is the time-invariant terms appearing in (58) and (59) that capture country-specific effects on economic performance.

In order to run these panel regressions, the study resorts essentially to the same data sources employed previously. However, due to data limitations, the present analysis covers only a relatively short period of time, namely, 2000-2014, to test the main propositions of theoretical models. In line with the traditional approach followed in the literature, the study uses data on relevant variables in the form of five-year averages to mitigate the impact of short-term disturbances and business cycles on parameter estimates (Dias and Tebaldi, 2012; Islam, 1995; Kılınç and Yetkiner, 2013). Therefore, the panel data considered in this section consists of observations from three different time periods and nearly a hundred cross-sections.

The dependent variables in (58) and (59), namely, $\ln y_{it}$ and g_{it} , are respectively the natural logarithm of five-year averaged GDP per capita (LNRGDP) and the average annual growth rate of income per capita over a five-year period

(RGDPGR). Correspondingly, the measures of institutional quality and the other variables considered in the analysis are defined so as to be compatible with the dependent variables (e.g., $\ln q_{it}$ is defined as the log of five-year averaged LSPR/POLFREE index for country i in period t). In growth regressions, the initial level of income, which captures the convergence dynamics in the model, is represented by the log of per capita GDP in the first year of each period (e.g., $\text{LNRGDPFR}_{i,2000}$ for the period 2000-2005).

Except for one, all the control variables included in the panel regressions are the same as those used previously in the cross-sectional analysis. The only variable that differs from the cross-section regressions is the Fraser Institutes' size of government index (SGIN), which is used in lieu of the TAXIN variable to capture the effect of government expenditures on economic performance. The main reason for replacing the TAXIN variable with SGIN is that the data on the top marginal income tax index is unavailable for a large number of countries (around 20) in the first two periods. Thus, employing this variable while transforming the data into five-year averages leads to the loss of a significant amount of information in the dataset. Contrarily, SGIN is available for almost all countries in the dataset and therefore helps increase the sample size up to 97. Moreover, the SGIN variable encompasses areas beyond the plain tax structure, including the form of government expenditures and the redistribution mechanisms (Gwartney et al., 2019b: 225-227). In this respect, it appears to give a more comprehensive and realistic picture of the overall impact of governmental activities on the economy. Analogous to TAXIN, the size of government index varies from 0 to 10, with higher scores indicating a smaller government size (or less influence of government actions on private decisions). In estimating regressions above, this variable is scaled to take values between 0 and 1 and used in the form of log of period averages to be consistent with the current panel framework.

The regression equations (58) and (59) can be estimated using different procedures that hinge on particular assumptions. One alternative approach is to employ the Random Effects (RE) estimator, which relies on the presumption that country-specific effects are independent of the regressors. In principle, the RE procedure assumes that unobserved individual-specific effects are distributed

randomly across units, and hence they can be subsumed under a composite error term. However, such assumptions regarding the nature of unobserved factors can only be appropriate when the dataset contains cross-sectional units drawn from a large population. Since many cross-country analyses predominantly cover a large number of countries, it appears that the reasoning underlying the RE approach is not convenient to estimate the parameters of a model established for examining income/growth differentials. In particular, if the panel data at hand comprise a large spectrum of countries, like the one considered here, it is more likely that the RE estimator would be inconsistent due to the possible heterogeneity bias and the correlation between neglected individual effects and regressors (Gujarati and Porter, 2009: 602-606).

In a panel framework consisting of a wide range of countries, the fixed effects (FE) model is preferable over alternatives since it allows for heterogeneity across cross-sections and provides consistent estimates of parameters even if unobservable characteristics of units correlate with the explanatory variables. To be more precise, FE estimators (either the within-group estimator or the least squares dummy variable, LSDV, estimator) recognize that country-specific effects may not be distributed randomly and thus attempt to control for these effects while estimating parameters. For instance, the within-group estimator, which transforms the original model in a way that expresses each variable as deviations from their corresponding means, drops the time-invariant effects from the model and herewith provides parameter estimates independent of the distorting influence of unit-specific factors. Differently, the LSDV procedure, which assigns a dummy variable for each cross-sectional unit, estimates the model under consideration by explicitly taking the unobserved country-specific effects into account. In practice, both of these models produce the same slope coefficients on variables, which are expected to be unbiased and consistent under usual assumptions (Gujarati and Porter, 2009: 596-602).

Given the features of the panel data framework here, the discussion so far implies that, intuitively, the FE procedure is more suitable than the RE method for estimating the parameters of the income and growth regressions in (58) and (59). In order to see formally whether this intuition is correct, the present analysis also employs the Hausman test that compares results from the RE and FE estimators and

indicates which model is giving a better fit. Within the context of the Hausman test, the implied null hypothesis is that unique errors are not correlated with regressors. Therefore, the rejection of the null hypothesis means that country-specific factors are not distributed randomly and have notable effects on parameter estimates, which, taken together, suggest that the FE model is more compatible with the data than the RE model.

The results of the Hausman test are reported in the last row of Table 8. In line with the expectations, the results below indicate that, in all cases, the null hypothesis that unobserved effects are uncorrelated with the explanatory variables is rejected at the 1% level. This means that the FE model should be preferred to the RE model in estimating income and growth regressions. Accordingly, the present analysis relies merely on the FE procedure to obtain coefficient estimates of each model mentioned above.

The empirical results from panel regressions are shown in Table 8. Here, columns (1)-(4) report panel data estimates for the income equation (58), whereas columns (5)-(8) demonstrate the results for the growth equation (59). Overall, the results appearing below suggest that panel data estimates covering the period 2000-2014 are strikingly similar to those obtained from cross-section regressions. In all specifications, it is found that institutional quality is correlated positively with economic performance: the higher the quality of economic and political institutions, the higher the income level and the growth rate, when all other things held constant. Additively, the results show that all the coefficients on LNLSPR and LNPOLFREE are statistically significant at conventional levels, no matter which dependent variable or which set of regressors are included in regression equations. Given that the panel data estimates below take account of the possible impact of unobserved county-specific factors alongside other variables, these findings appear to lend strong support for the idea that institutional development is key to economic progress. On that basis, one can firmly state that panel data regressions, similar to cross-section analyses, confirm that institutions of private property rights and democratic political systems are two of the main determinants of economic growth and prosperity.

Table 8: Economic Performance and Institutions: Panel Regressions of 5-year span data, Fixed Effects (FE) Estimates, 2000-2014

	Dependent Variable is log of 5-year averaged GDP per capita, (LNRGDP)				Dependent Variable is the average annual growth rate of GDP per capita over 5-year period, (RGDPGR)			
	MODEL 1		MODEL 2		MODEL 1		MODEL 2	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
C	9.9957 *** (0.0644)	9.9307 *** (0.0960)	9.6362 *** (0.0164)	9.5775 *** (0.0841)	0.6336 *** (0.0262)	0.5266 *** (0.0448)	0.6204 *** (0.0298)	0.5517 *** (0.0310)
LNLSPR	0.1463 *** (0.0119)		0.1615 *** (0.0196)		0.0144 *** (0.0031)		0.0116 *** (0.0021)	
LNPOLFREE		-0.0850 ** (0.0387)		-0.0967 ** (0.0050)		-0.0131 *** (0.0031)		-0.0130 *** (0.0027)
LNRGDPFR _{it}					-0.0424 *** (0.0022)	-0.0342 *** (0.0037)	-0.0416 *** (0.0024)	-0.0367 *** (0.0034)
LNS	0.2752 *** (0.0176)	0.3007 *** (0.0237)	0.2679 *** (0.0171)	0.2912 *** (0.0232)	0.0034 ** (0.0014)	0.0075 *** (0.0021)	0.0031 ** (0.0013)	0.0071 *** (0.0017)
LNEFDEP	0.0602 ** (0.0245)	0.1067 *** (0.0380)	0.0444 *** (0.0114)	0.1035 *** (0.0320)	0.0858 *** (0.0027)	0.0796 *** (0.0112)	0.0836 *** (0.0040)	0.0826 *** (0.0077)
LNETHFR	0.2909 *** (0.0156)	0.2868 *** (0.0172)			-0.0002 (0.0028)	-0.0008 (0.0028)		
LNSGIN			0.0105 (0.0224)	0.0167 ** (0.0416)			0.0036 (0.0045)	-0.0107 *** (0.0036)
Number of Cross-sections	92	92	97	97	92	92	97	97
R-squared	0.99	0.99	0.99	0.99	0.99	0.93	0.99	0.94
Hausman Test (Chi-square)	152.07 ***	98.30 ***	154.71 ***	80.42 ***	28.69 ***	30.02 ***	32.06 ***	35.21 ***

Notes: Columns (1)-(4) show estimations for income equations, whereas columns (5)-(8) show estimations for growth equations. LNRPDPFR_{it} is the log of per capita income in the first year of period *t*. LNSGIN is the log of size of government index provided by Fraser Institute. SGIN is originally measured on a scale from 0 to 10, where higher scores correspond to smaller government. Each variable in the table represents 5-year averages. LSPR, POLFREE, and SGIN are scaled to values between 0 and 1. All regressors are in logs. Values reported under coefficient estimates are heteroskedasticity-consistent (robust) standard errors. ***, **, * denote significance at the 1, 5, and 10 percent level, respectively.

In addition to the results above, the present analysis verifies the previously mentioned pattern that improvements in economic institutions are much more rewarding than that of political institutions. The results from both income and growth regressions reveal that, except for one case (i.e., the growth regression for Model 2), the estimated coefficients on economic institutions are larger than the ones belonging to political institutions, which indicates that income levels and growth rates are more responsive to developments in economic institutions. Thus, the evidence from panel regressions implicitly suggest that while reforming institutional structures, starting from economic institutions might lead up to a faster development process, at least for a short period of time.

The results appearing in Table 8 also affirm the quantitative significance of physical capital accumulation pointed out by the preceding analysis. In all specifications, the LNS variable enters the regressions with a significantly positive coefficient. In income regressions, the estimated coefficient on LNS ranges from 0.27 (column (3)) to 0.30 (column (4)), which is quite high in comparison to corresponding coefficients on institutions and other control variables. Although the estimates of the same coefficients in growth regression are relatively low, the evidence shows that LNS remains statistically and economically significant even after controlling for initial income, institutional quality, and other country-specific factors. Thus, similar to the cross-sectional analysis, panel data estimates indicate that the savings ratio is a consistent and robust predictor of the long-run economic performance of countries.

Another critical result jumping out of Table 8 is that the conditional convergence hypothesis is prevalent for the period 2000-2014 as well. Columns (5)-(8) show that the initial level of per capita income has a statistically significant and negative impact on subsequent growth. According to the table, the estimated coefficient on LNRGDPFR_{it} is between -0.0342 (column (6)) and -0.0424 (column (5)), indicating that a log-point decline in initial per capita GDP would raise the growth rate in the following period at around 4%. In magnitude, this effect is relatively large compared to results from cross-sectional analyses, which envisage at most a 1% increase in growth rates in response to the same level of decline (column (6) in Table 7). Thus, the present analysis corroborates that initial conditions become

more binding as the length of the period under consideration shortens. But, one should remember that these effects hold only for countries having similar characteristics. As the conditional convergence hypothesis asserts, the results above imply that the possible gains of being underdeveloped can only emerge if some characteristics of countries, such as institutional structures or capital accumulation rates, are close to each other.

Apart from these, the regression estimates in Table 8 reveal some interesting but controversial results regarding the effect of other control variables on economic performance. For instance, unlike the cross-sectional analysis, panel regressions provide no compelling evidence of a systematic relationship between economic performance and the degree of ethnic fractionalization. As the results indicate, the sign and significance of LNETHFR vary with the estimated model. Although the results for income equations demonstrate that ethnic diversity is somehow correlated positively with per capita income, the growth regressions do not show any sign of a significant and robust relationship between LNETHFR and economic growth. A similar pattern is observed for the size of government index as well. The coefficient on LNSGIN is found to be statistically significant in only half of the regressions, in which it appears with opposite signs. Therefore, the results obtained from panel regressions indicate that differences in government size and ethnic composition have no direct impact on economic performance when the unobserved country-specific effects are taken into account.

Lastly, the analysis shows that, contrary to expectations, the effective depreciation rate is positively associated with income levels and growth rates. The results above reveal that this relationship is statistically significant in all regressions. Since the rate of technological progress is assumed to be fixed across countries, this finding implies a positive association between economic performance and a composite term representing the sum of the rate of depreciation and population growth. However, one should abstain from ascribing too much meaning to this result. The reason for this is that the period under consideration is relatively short and that cross-sectional analysis before has not implied a clear relationship between the effective depreciation rate and dependent variables. Therefore, rather than reflecting a strong connection between population growth, depreciation rate, and economic

performance, it is more likely that the results above indicate a spurious relationship, which is specific to the period covered here.

To sum up, this section has examined the relationships between economic performance, institutions, and other control variables using a panel data framework that takes account of unobserved country-specific effects. By and large, the results based on FE estimates corroborate the evidence provided by the cross-section analysis and confirm the main predictions of theoretical models. As before, institutional quality and physical capital are found to be correlated positively with the level and growth rate of income. These findings imply that no matter which time period is regarded or no matter which method of estimation is employed, institutional structures and physical capital accumulation have substantial impacts on the development process. Furthermore, the present analysis has replicated the evidence from previous analyses that point to a conditional convergence among economies. It is found that higher levels of initial per capita GDP are associated with lower growth rates, in line with the convergence hypothesis. On the other hand, the panel data regressions show that once the country-specific effects are incorporated into models, cultural diversity and the government size appear to have no systematic impact on economic outcomes. Thus, just like the cross-sectional regression, panel data estimates over the 2000-2014 period highlights institutions, capital formation, and initial level of income as main determinants of growth and prosperity.

3.4. CONCLUDING REMARKS

This chapter has examined the empirical relationship between institutional structures and the economic performance of countries. The results based on both correlation analyses and regression estimations revealed that institutions that define incentive structures in economic and political spheres play critical roles in the process of economic development. The evidence showed that, on average, countries having high-quality institutions tend to have higher income levels and faster growth rates. Additionally, the analysis indicated that this positive association between institutional quality and economic performance holds when country-specific effects and the endogeneity problem are taken into account. In this respect, the results

presented in this chapter seem to provide strong support for the view that institutional development is one of the fundamental factors in promoting economic progress.

The empirical findings have also shown that capital formation, cultural characteristics, and tax structure play a partial role in determining economic performance. The analysis relying on regression estimates revealed that countries having higher saving rates, less fragmented societies, and lower tax rates show better economic performance than others with opposite characteristics. In addition to this, the analysis has provided suggestive evidence for the conditional convergence hypothesis. The growth regressions demonstrated that countries would record higher growth rates to the extent that they have lower initial income once other factors were held constant. Given the definition of conditional convergence hypothesis, this finding implies that income gaps between rich and poor countries can narrow in time only if these countries have similar characteristics in terms of institutional quality, capital formation, population growth, cultural diversity, and tax structure. Otherwise, the evidence indicates that it is more likely to see divergence rather than converge. Hence, the present analysis suggests that country-specific factors have notable impacts on the convergence dynamics, and ignoring these fundamental elements may lead to false inferences and expectations regarding the evolution of income differences among countries over time.

Lastly, the study has shown that inclusive economic institutions seem to be more rewarding for economic development than their political counterparts. The regression analyses based on both income and growth equations illustrated that the estimated impact of institutions of property rights on economic performance is larger than that of political institutions. Assuming that all other things equal, this finding implies that the process of economic development is related more to improvements in institutional arrangements regarding property rights rather than to developments in the political sphere.

The results documented in this chapter reveal important implications for several areas ranging from academic studies to practical issues such as policy-making. For instance, the present analysis suggests that institutions should definitely be involved in studies on growth and comparative development. As shown, cross-

country variations in economic performance correlate directly with institutional differences. Therefore, the results above propose that both theoretical and empirical studies aimed to examine determinants of international differences in living standards should consider institutions and how they evolve in time in the first place.

Besides this, the findings presented here provide a rough but helpful guideline to policy-makers. As the evidence revealed, capital formation and institutional development are two main pillars of economic growth and prosperity. On that account, the results essentially suggest that national governments, which target fostering economic progress, should focus on designing policies that improve the institutional framework and provide an environment favorable for capital formation. Given that the capital accumulation process is intimately related to conditions imposed by institutions, this argument implies that creating an institutional setting that secures private property rights and limits disproportional political power should be the primary task of decision-makers. Thus, the study mainly states that countries, especially those lagging in the development race, should give particular importance to long-term reforms such as replacing extractive institutions that hamper economic progress with inclusive ones. In this respect, abolishing arbitrary economic and political privileges and then forming institutions that expand opportunities and freedoms toward the majority of people in society would be promising steps to promote economic progress. In particular, the current analysis suggests that governments can give more weight to improving property rights and accompanying legal systems than reforming political institutions, as improvements in these areas are found more rewarding than advances in the political sphere. Considering the fact that changes in political structures and processes are generally onerous and take time due to their nature, this suggestion basically implies that the issue of how to design and improve institutions in the economic sphere should come first in the policy agenda of governments.

CONCLUSION

This thesis examined the wide variations in economic growth and prosperity across countries by developing arguments and hypotheses based on the institutional approach. The evidence derived from both theoretical and empirical analysis has revealed a number of points worth mentioning.

First, the study at hand discloses that inequality is a dominant feature of the world income distribution. The analyses presented in the first part of the thesis indicate that economic conditions vary significantly across countries. According to the results, cross-country differences in income levels and growth rates are huge and tend to persist over time. The evidence also suggests that the bulk of these variations can be ascribed directly to institutional differences since alternative approaches such as geography or culture hypothesis have no particular explanation for observed differences among countries having similar features.

Second, the thesis demonstrates that institutional structures have qualitative impacts on economic outcomes. By developing two alternative models, the study shows that institutional development contributes to economic progress in various ways. The results derived from both models suggest that economies having better institutions would have higher growth rates, income levels, and capital stocks, all other things being equal. Accordingly, it is hypothesized that differences in institutional arrangements should explain at least a portion of variations in economic development and growth across national boundaries. Besides this, the theoretical models show that several factors other than institutions such as savings/investment ratios, the tax structure, social capital, the initial level of development, and government policies could affect economic outcomes. Therefore, the analysis implies that the long-run development path is determined by a set of variables, and each of these variables should be included in the analysis of cross-country variations in prosperity.

Third, the thesis at hand substantiates that the empirical patterns are broadly compatible with the key predictions of the developed theories. For instance, the examination of the cross-country data over different time periods indicates that institutional factors have notable impacts on the long-run economic performance.

The evidence shows that improvements in institutional quality are correlated positively with income levels, growth rates, and capital formation, as suggested by theoretical models. Indeed, the analysis reveals that both economic and political institutions affect economic outcomes, albeit the impact of economic institutions appears to be larger in magnitude. Further, the study demonstrates that these results are not driven by choice of estimation strategy and are robust to controlling for other factors derived from the theoretical models. On the other hand, the empirical estimates suggest that the savings ratio, the degree of ethnic fractionalization, and tax rates have statistically significant effects on either income levels or growth rates. However, it is found that except savings ratio, these factors together have a relatively small influence on economic performance compared to that of institutions. Lastly, the study shows that evidence only supports the conditional convergence hypothesis, implying that income levels would converge only among nations having similar characteristics. Given the considerable effects of institutional quality and capital formation on economic performance, this result means that if countries have significantly different savings ratios and institutional frameworks, income differentials may not close but persist in time.

These findings have several important implications for the policy design. The first and foremost implication is that development strategies and long-term macroeconomic plans should be designed so as to embrace institutional arrangements and reforms. As the results highlight, the origins of economic growth and prosperity are far more related to institutional development than any other factor. Additionally, it is shown that improvements in institutional structures have potentially high returns in terms of economic performance. Therefore, this thesis mainly suggests that, if the objective is to achieve prosperity in the long run, economic policies should be directed at designing an institutional framework that provides a secure and stable environment in which individuals can engage in productive activities and enjoy the fruits of their efforts. To this end, governments and policy-makers should spend their energy and political capital on reforming inefficient arrangements and take concrete steps in improving institutional structures in legal, economic, and political spheres. Within this context, issues regarding the protection of property rights, provision of

efficient legal systems, and formulation of an inclusive political structure responsive to the demands of society should be considered on the top of the policy agenda.

The results also suggest that governments should center upon setting up a structure that supports investments, given the salient role of capital formation in the long-run economic performance. As it is well-known, many backward and developing nations suffer from a capital shortage and apply different macroeconomic policies ranging from capital market liberalization to interest/exchange rate policies to attract more capital. Although it is entirely understandable in the sense of the mentioned purpose, these policies barely satisfy the needs of these countries. In most cases, applying such policies incur substantial social, economic, and political costs and often result in hot money flows rather than fueling new investments. The problem here is pretty straightforward. These unwanted side effects stem essentially not from the policies themselves but the unfavorable conditions provided by the countries. As investments are risky by their nature, both domestic and international agents tend to bring their capital to places where the political and economic environment is relatively stable and surrounded by high-quality institutions that secure property rights, restrain political power, and ensure the rule of law. When the local conditions are the opposite, they naturally either desist from investing or ask for higher returns/interests on their investments to minimize their risk.

The analysis presented in this thesis proposes a far more reliable recipe for capital-poor nations to overcome these problems and lower the “price” of capital. Since the capital accumulation process is closely related to institutional development, it is suggested that countries, particularly those intending to increase their capital stocks, should give more weight to the long-term institutional arrangements rather than economic policies having a short-term horizon. Accordingly, governments may attempt to develop efficient capital markets and improve the accompanying regulatory, monitoring, and legal infrastructures to encourage investors. Although this does not mean that countries all wrapped up in this kind of policy recipe would automatically attract more capital and observe an immediate upsurge in new investments, such arrangements and reforms will help them provide a more inclusive economic climate and ultimately set the scene for capital accumulation and economic development in the long term.

Before passing on to the final remarks, it has to be noted that the policy recommendations above should not be considered in a strict manner. The present analysis only sets out a general guideline for how to design development policies around institutional factors. However, as countries differ significantly in socio-economic conditions, traditions, and cultural characteristics, their needs and particular solutions to meet those needs tend to be quite different too. Thus, it is apparent that the effects and efficiency of institutional structures may vary from country to country, which implies that there is no universal set of rules and arrangements that could bring an equal amount of prosperity to every society. Yet, that is not to say that the general framework mentioned above is entirely impractical. Instead, this fact suggests that governments and policy-makers have to be creative while attempting to find solutions to local problems. They should aim at generating original ideas and institutional forms compatible with the general principles rather than directly establishing or copying the rules, laws, and regulations that appear to be effective somewhere else. Otherwise, no matter how well-intentioned the goal is, the results may not be as beneficial as expected.

Other than these considerations, this thesis implicitly points to the critical role of political preferences/actions of societies in shaping the evolution of institutions, and thereby, the process of economic development. The analysis above intuitively indicates that by exerting influence over governments and decision-makers, societies can change their fate: if people constantly demand a more egalitarian and inclusive institutional infrastructure and act upon this will, they can steer state policies towards long-term institutional reforms that support economic progress. Although the repercussions of these actions on governments and resultant institutional arrangements may vary in reality according to political, social, and economic conditions prevailing in a country, the results here suggest that the path to prosperity is intimately related to social preferences. Therefore, it appears that controlling the “Leviathan” and forcing it steadily to provide a level playing field should be the ultimate task of societies, as implied by Acemoglu and Robinson (2020).

As a final word, it should be mentioned that the thesis at hand only represents a humble attempt to understand the relationship between institutional structures and prosperity. Despite the fact that it has provided theoretical and empirical evidence on

the joint evolution of institutional and economic development and derived some policy implications from these findings, this study explores only a tiny part of the relationship. Some theoretical and empirical issues, particularly concerning the micro-foundations of institutional changes and their impacts on economic outcomes, wait to be explored yet. Also, the interactions between formal and informal institutions and how to incorporate them into the theoretical and empirical analysis of growth and development are still among the most critical problems that need to be gotten over. Hence, in order to get a much deeper understanding of the connections between institutions and economic performance, future research should be directed at these challenging but promising study fields.



REFERENCES

Acemoglu, D. (2009). *Introduction to Modern Economic Growth*. Princeton: Princeton University Press.

Acemoglu, D., Johnson, S. and Robinson, J. A. (2000). The Colonial Origins of Comparative Development: An Empirical Investigation. *NBER Working Paper Series*. 7771: 1-43.

Acemoglu, D., Johnson, S. and Robinson, J. A. (2001). The Colonial Origins of Comparative Development: An Empirical Investigation. *The American Economic Review*. 91(5): 1369-1401.

Acemoglu, D., Johnson, S. and Robinson, J. A. (2002). Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution. *The Quarterly Journal of Economics*. 117(4): 1231-1294.

Acemoglu, D., Naidu, S., Restrepo, P. and Robinson, J. A. (2014). Democracy Does Cause Growth. *NBER Working Paper Series*. 20004: 1-64.

Acemoglu, D. and Robinson, J. A. (2013). *Why Nations Fail: The Origins of Power, Prosperity and Poverty*. London: Profile Books.

Acemoglu, D. and Robinson, J. A. (2020). *Dar Koridor: Devletler, Toplumlar ve Özgürlüğün Geleceği*. Çev. Yüksel Taşkın. İstanbul: Doğan Kitap.

Alesina, A. and Rodrik, D. (1994). Distributive Politics and Economic Growth. *The Quarterly Journal of Economics*. 109(2): 465-490.

Assane, D. and Grammy, A. (2003). Institutional framework and economic development: international evidence. *Applied Economics*. 35(17): 1811-1817.

Barro, R. J. (1990). Government spending in a simple model of endogenous growth. *Journal of Political Economy*. 98(5): 103-125.

Barro, R. J. and McCleary, R. M. (2003). Religion and Economic Growth across Countries. *American Sociological Review*. 68(5): 760-781.

Barro, R. J. and Sala-i-Martin, X. (2004). *Economic Growth*. Cambridge: The MIT Press.

Becker, G. S. (1983). A Theory of Competition Among Pressure Groups for Political Influence. *The Quarterly Journal of Economics*. 98(3): 371-400.

Blum, U. and Dudley, L. (2001). Religion and economic growth: was Weber right?. *Journal of Evolutionary Economics*. 11(2): 207-230.

Boland, L. A. (1979). Knowledge and the Role of Institutions in Economic Theory. *Journal of Economic Issues*. 13(4): 957-972.

Bourguignon, F. and Morrisson, C. (2002). Inequality Among World Citizens: 1820-1992. *The American Economic Review*. 92(4): 727-744.

Carpantier, J. and Litina, A. (2018). Dissecting the act of god: an exploration of the effect of religiosity on economic activity. *The B.E. Journal of Macroeconomics*. 19(2): 1-25.

Coase, R. H. (1937). The Nature of the Firm. *Economica*. 4(16): 386-405.

Coase, R. H. (1960). The Problem of Social Cost. *The Journal of Law and Economics*. 3: 1-44.

Dahl, R. A. (2018). *Siyasi Eşitlik Üzerine*. Çev. A. Emre Zeybekoğlu. Ankara: Dost Kitabevi Yayınları.

Decker, J. H. and Lim, J. J. (2008). What fundamentally drives growth? Revisiting the institutions and economic performance debate. *Journal of International Development*. 20(5): 698-725.

De Haan, J. and Siermann, C. L. J. (1996). New Evidence on the Relationship between Democracy and Economic Growth. *Public Choice*. 86(1/2): 175-198.

De Long, J. B. (1988). Productivity Growth, Convergence, and Welfare: Comment. *The American Economic Review*. 78(5): 1138-1154.

Diamond, J. (2004). *Tüfek, Mikrop ve Çelik – İnsan Topluluklarının Yazgıları*. Çev. Ülker İnce. Ankara: Tübitak Popüler Bilim Kitapları.

Diamond, J. (2019). *Çöküş: Toplular Başarısızlığı ya da Başarıyı Nasıl Seçerler?*. Çev. Barış Baysal. İstanbul: Pegasus Yayınları.

Dias, J. and Tebaldi, E. (2012). Institutions, human capital, and growth: The institutional mechanism. *Structural Change and Economic Dynamics*. 23(3): 300-312.

Domar, E. D. (1946). Capital Expansion, Rate of Growth, and Employment. *Econometrica*. 14(2): 137-147.

Drazanova, L. (2019). *Historical Index of Ethnic Fractionalization Dataset (HIEF)*. Harvard Dataverse, V2.

<https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/4JQRCL>, (11.01.2021).

Drazanova, L. (2020). Introducing the Historical Index of Ethnic Fractionalization (HIEF) Dataset: Accounting for Longitudinal Changes in Ethnic Diversity. *Journal of Open Humanities Data*. 6(6): 1-8.

Dreher, A., Meon, P. G. and Schneider, F. (2014). The devil is in the shadow. Do institutions affect income and productivity or only official income and official productivity?. *Public Choice*. 158: 121-141.

Drury, A. C., Krieckhaus, J. and Lusztig, M. (2006). Corruption, Democracy, and Economic Growth. *International Political Science Review / Revue internationale de science politique*. 27(2): 121-136.

Durlauf, S. N., Johnson, P. A. and Temple, J. R. W. (2004). Growth econometrics. *Vassar College Economics Working Paper*. 61: 1-183.

Durlauf, S. N., Kourtellos, A. and Tan, C. M. (2011). Is God in the Details? A Reexamination of the Role of Religion in Economic Growth. *Journal of Applied Econometrics*. 27(7): 1059-1075.

Easterlin, R. A. (1981). Why Isn't the Whole World Developed?. *The Journal of Economic History*. 41(1): 1-19.

Easterly, W. and Levine, R. (2003). Tropics, germs, and crops: how endowments influence economic development. *Journal of Monetary Economics*. 50(1): 3-39.

Emerson, P. M. (2006). Corruption, competition and democracy. *Journal of Development Economics*. 81(1): 193-212.

Esfahani, H. S. and Ramirez, M. T. (2003). Institutions, infrastructure, and economic growth. *Journal of Development Economics*. 70(2): 443-477.

Feenstra, R. C., Inklaar, R. and Timmer, M. P. (2015). The Next Generation of the Penn World Table. *The American Economic Review*. 105(10): 3150-3182.

Frankel, J. A. and Romer, D. (1999). Does Trade Cause Growth?. *The American Economic Review*. 89(3): 379-399.

Freedom House. (2019a). *Freedom in the World 2019: Democracy in Retreat*. https://freedomhouse.org/sites/default/files/2020-02/Feb2019_FH_FITW_2019_Report_ForWeb-compressed.pdf, (22.02.2020).

Freedom House. (2019b). *Freedom in the World 2019 Methodology*. https://freedomhouse.org/sites/default/files/2020-02/Methodology_FIW_2019_for_website.pdf, (22.02.2020).

Gallup, J. L. and Sachs, J. D. (2000a). Agriculture, Climate, and Technology: Why Are the Tropics Falling behind?. *American Journal of Agricultural Economics*. 82(3): 731-737.

Gallup, J. L. and Sachs, J. D. (2000b). The Economic Burden of Malaria. *CID Working Paper Series*. 52: 1-22.

Gallup, J. L., Sachs, J. D. and Mellinger, A. D. (1998). Geography and Economic Development. *NBER Working Paper Series*. 6849: 1-81.

Glaeser, E. L., La Porta, R., Lopez-de-Silanes, F. and Shleifer, A. (2004). Do Institutions Cause Growth?. *Journal of Economic Growth*. 9(3): 271-303

Greif, A. (2006). *Institutions and the Path to the Modern Economy: Lessons from Medieval Trade*. New York: Cambridge University Press.

Gujarati, D. N. and Porter, D. C. (2009). *Basic Econometrics*. New York: The McGraw-Hill Companies, Inc.

Gwartney, J., Lawson, R., Hall, J. and Murphy R. (2019a). *Economic Freedom Dataset, published in Economic Freedom of the World: 2019 Annual Report*. Fraser Institute. www.fraserinstitute.org/economic-freedom/dataset, (26.09.2019).

Gwartney, J., Lawson, R., Hall, J. and Murphy R. (2019b). *Economic Freedom of the World: 2019 Annual Report*. Fraser Institute.

<https://www.fraserinstitute.org/studies/economic-freedom>, (26.09.2019).

Hall, R. E. and Jones, C. I. (1999). Why Do Some Countries Produce So Much More Output Per Worker Than Others?. *The Quarterly Journal of Economics*. 114(1): 83-116.

Harrod, R. F. (1939). An Essay in Dynamic Theory. *The Economic Journal*. 49(193): 14-33.

Islam, N. (1995). Growth Empirics. *The Quarterly Journal of Economics*. 110(4): 1127-1170.

Kane, T. (2016). Accelerating Convergence in the World Income Distribution. *Hoover Institution Economics Working Paper*. 16102: 1-15.

Kılınç, D. and Yetkiner, H. (2013). Does Gender Matter for Economic Convergence? The OECD Evidence. *Izmir University of Economics Working Papers in Economics*. 13/02: 1-19.

Kleiber, C. (2007). The Lorenz curve in economics and econometrics. *WWZ Working Paper*. 09/07: 1-32.

Knack, S. and Keefer, P. (1995). Institutions and Economic Performance: Cross-Country Tests Using Alternative Institutional Measures. *Economics and Politics*. 7(3): 207-227.

Krueger, A. O. (1974). The Political Economy of the Rent-Seeking Society. *The American Economic Review*. 64(3): 291-303.

Landes, D. S. (1990). Why are We So Rich and They So Poor?. *The American Economic Review*. 80(2): 1-13.

Landes, D. S. (2017). *Milletlerin Zenginliđi ve Yoksulluđu: Neden Bazıları Çok Zengin, Bazıları Çok Yoksuldur?*. Çev. Ayşe Su Doğru. İstanbul: Feylesof Kitap.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A. and Vishny, R. W. (1998). Law and Finance. *Journal of Political Economy*. 106(6): 1113-1155.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A. and Vishny, R. W. (1999). The quality of government. *The Journal of Law, Economics, and Organization*. 15(1): 222-279.

Leblang, D. A. (1996). Property Rights, Democracy and Economic Growth. *Political Research Quarterly*. 49(1): 5-26.

Lee, M., Longmire, R., Matyas, L. and Harris, M. (1998). Growth convergence: some panel data evidence. *Applied Economics*. 30(7): 907-912.

Leightner, J. E. and Inoue, T. (2007). Tackling the omitted variables problem without the strong assumptions of proxies. *European Journal of Operational Research*. 178(3): 819-840.

Lucas, R. E. (1988). On the mechanics of economic development. *Journal of Monetary Economics*. 22(1): 3-42.

Mankiw, N. G., Romer, D. and Weil, D. N. (1992). A Contribution to the Empirics of Economic Growth. *The Quarterly Journal of Economics*. 107(2): 407-437.

Matthews, R. C. O. (1986). The Economics of Institutions and the Sources of Growth. *The Economic Journal*. 96(384): 903-918.

Mauro, P. (1995). Corruption and Growth. *The Quarterly Journal of Economics*. 110(3): 681-712.

Melitz, J. and Toubal, F. (2012). Native language, spoken language, translation and trade. *CEPII, Working Papers*. 2012-17: 1-80.

Melitz, J. and Toubal, F. (2014). Native language, spoken language, translation and trade. *Journal of International Economics*. 93(2): 351-363.

Meltzer, A. H. and Richard, S. F. (1981). A Rational Theory of the Size of Government. *Journal of Political Economy*. 89(5): 914-927.

North, D. C. (1990). *Institutions, institutional change and economic performance*. Cambridge: Cambridge University Press.

North, D. C. (1991). Institutions. *Journal of Economic Perspectives*. 5(1): 97-112.

Olson, M. (1993). Dictatorship, Democracy, and Development. *The American Political Science Review*. 87(3): 567-576.

Phelps, E. (1961). The Golden Rule of Accumulation: A Fable for Growthmen. *The American Economic Review*. 51(4): 638-643.

Pritchett, L. (1997). Divergence, Big Time. *The Journal of Economic Perspectives*. 11(3): 3-17.

Przeworski, A. and Limongi, F. (1993). Political Regimes and Economic Growth. *The Journal of Economic Perspectives*. 7(3): 51-69.

Przeworski, A. and Wallerstein, M. (1988). Structural Dependence of the State on Capital. *The American Political Science Review*. 82(1): 11-29.

Rodrik, D., Subramanian, A. and Trebbi, F. (2004). Institutions Rule: The Primacy of Institutions Over Geography and Integration in Economic Development. *Journal of Economic Growth*. 9: 131-165.

Rodrik, D. and Wacziarg, R. (2005). Do Democratic Transitions Produce Bad Economic Outcomes?. *The American Economic Review*. 95(2): 50-55.

Romer, P. M. (1990). Endogenous Technological Change. *Journal of Political Economy*. 98(5): 71-102.

Sachs, J. D. (2001). Tropical Underdevelopment. *NBER Working Paper Series*. 8119: 1-34.

Sachs, J. D. and Warner, A. M. (1995). Natural Resource Abundance and Economic Growth. *NBER Working Paper Series*. 5398: 1-47.

Sachs, J. D. and Warner, A. M. (1997). Fundamental Sources of Long-Run Growth. *The American Economic Review*. 87(2): 184-188.

Sala-i-Martin, X. (2002). The Disturbing “Rise” of Global Income Inequality. *NBER Working Paper Series*. 8904: 1-72.

Scully, G. W. (1988). The Institutional Framework and Economic Development. *Journal of Political Economy*. 96(3): 652-662.

Smith, A. (2006). *Milletlerin Zenginliği*. Çev. Haldun Derin. İstanbul: Türkiye İş Bankası Kültür Yayınları.

Sokoloff, K. L. and Engerman, S. L. (2000). History Lessons: Institutions, Factor Endowments, and Paths of Development in the New World. *The Journal of Economic Perspectives*. 14(3): 217-232.

Solow, R. M. (1956). A Contribution to the Theory of Economic Growth. *The Quarterly Journal of Economics*. 70(1): 65-94.

Solow, R. M. (1957). Technical Change and the Aggregate Production Function. *The Review of Economics and Statistics*. 39(3): 312-320.

Tavares, J. and Wacziarg, R. (2001). How democracy affects growth. *European Economic Review*. 45(8): 1341-1378.

Tebaldi, E. and Elmslie, B. (2013). Does institutional quality impact innovation? Evidence from cross-country patent grant data. *Applied Economics*. 45(7): 887-900.

Tebaldi, E. and Mohan, R. (2008). Institutions-Augmented Solow Model And Club Convergence. *MPRA*. 10386: 1-8.

The World Bank, World Development Indicators. (2020). *Life expectancy at birth, total (years) – Central African Republic*.
https://data.worldbank.org/indicator/SP.DYN.LE00.IN?locations=CF&name_desc=false&view=chart, (07.04.2020).

The World Bank. (1991). *World Development Report 1991: The Challenge of Development*. New York: Oxford University Press.

The United Nations (1999). *Standard Country or Area Codes for Statistics Use, 1999 (Revision 4)*. New York: United Nations Publications.
[https://unstats.un.org/unsd/publication/SeriesM/Series_M49_Rev4\(1999\)_en.pdf](https://unstats.un.org/unsd/publication/SeriesM/Series_M49_Rev4(1999)_en.pdf), (13.04.2020).

Weber, M. (2005). *The Protestant Ethic and the Spirit of Capitalism*. London and New York: Routledge.

Yeldan, E. (2009). *The Economics of Growth and Distribution*. Ankara: Eflatun Publishing House.





APPENDICES

APPENDIX 1: The List of Countries in the Transition Matrix, by Income Groups

Appendix Table 1: The List of Countries by Income Groups, 1960

The Top Class	The Upper-Middle Class	The Middle Class	The Lower-Middle Class	The Lowest Class
- Australia - Austria - Belgium - Canada - Denmark - Finland - France - Germany - Israel - Netherlands - New Zealand - Norway - Sweden - Switzerland - United Kingdom - United States	- Ireland - Italy - Trinidad and Tobago - Uruguay - Venezuela	- Algeria - Chile - Costa Rica - Greece - Jamaica - Japan - Mexico - Nicaragua - Portugal - South Africa - Spain - Turkey	- Argentina - Brazil - Colombia - D.R. Congo - Dominican Republic - Ecuador - Ghana - Guatemala - Honduras - Hong Kong, SAR - Jordan - Malaysia - Mauritius - Namibia - Nigeria - Panama - Peru - Senegal - Singapore - Sri Lanka - Taiwan - Zambia - Zimbabwe	- Bangladesh - Benin - Bolivia - Botswana - Burkina Faso - Burundi - Cameroon - Central African Republic - Chad - China - Côte d'Ivoire - Egypt - El Salvador - Ethiopia - Gambia - Guinea - Guinea-Bissau - Haiti - India - Indonesia - Kenya - Lesotho - Madagascar - Malawi - Mali - Mauritania - Morocco - Mozambique - Nepal - Niger - Pakistan - Paraguay - Philippines - Republic of Korea - Republic of the Congo - Romania - Rwanda - Syrian Arab Republic - Thailand - Togo - Tunisia - U.R. of Tanzania - Uganda

Appendix Table 2: The List of Countries by Income Groups, 2014

The Top Class	The Upper-Middle Class	The Middle Class	The Lower-Middle Class	The Lowest Class
- Australia - Austria - Belgium - Canada - Hong Kong, SAR - Denmark - Finland - France - Germany - Ireland - Israel - Italy - Japan - Netherlands - New Zealand - Norway - Republic of Korea - Singapore - Spain - Sweden - Switzerland - Taiwan - Trinidad and Tobago - United Kingdom - United States	- Chile - Greece - Malaysia - Portugal	- Argentina - Botswana - Brazil - Mauritius - Mexico - Panama - Romania - Turkey - Uruguay	- Algeria - China - Colombia - Costa Rica - Dominican Republic - Ecuador - Egypt - El Salvador - Indonesia - Jamaica - Jordan - Morocco - Namibia - Paraguay - Peru - South Africa - Sri Lanka - Thailand - Tunisia - Venezuela	- Bangladesh - Benin - Bolivia - Burkina Faso - Burundi - Cameroon - Central African Republic - Chad - Côte d'Ivoire - D.R. Congo - Ethiopia - Gambia - Ghana - Guatemala - Guinea - Guinea-Bissau - Haiti - Honduras - India - Kenya - Lesotho - Madagascar - Malawi - Mali - Mauritania - Mozambique - Nepal - Nicaragua - Niger - Nigeria - Pakistan - Philippines - Republic of the Congo - Rwanda - Senegal - Syrian Arab Republic - Togo - U.R. of Tanzania - Uganda - Zambia - Zimbabwe

APPENDIX 2: First Stage Results of 2SLS Estimates in Tables 4-7

Appendix Table 3: First Stage Results of 2SLS Estimates in Tables 4-5

Panel A. Dependent Variable is LNLSPR (Table 4)								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
LNETM		-0.1176 *** (0.0362)			-0.1069 *** (0.0362)			-0.1069 *** (0.0381)
LNCSL			-0.0356 (0.0295)			-0.0291 (0.0327)		-0.0375 (0.0277)
LNHC60		0.5328 *** (0.1232)	0.9927 *** (0.1036)		0.6134 *** (0.1592)	0.8463 *** (0.1664)		0.5800 *** (0.1659)
								0.8618 *** (0.1510)
Number of Observations	-	60	87	-	56	82	-	60
R-squared	-	0.58	0.62	-	0.58	0.65	-	0.59
F-stat.	-	39.61	68.21	-	13.55	27.96	-	15.76
								29.96
Panel B. Dependent Variable is LNPOLFREE (Table 5)								
LNETM		-0.0531 (0.0452)			-0.0272 (0.0491)			-0.0357 (0.0478)
LNCSL			-0.0938 ** (0.0385)			0.0740 (0.0448)		-0.0726 * (0.0383)
LNHC60		-1.7525 *** (0.1621)	-1.4289 *** (0.1345)		-1.7066 *** (0.1868)	-1.4506 *** (0.2074)		-1.6598 *** (0.2001)
								-1.4011 *** (0.1822)
Number of Observations	-	61	88	-	57	83	-	61
R-squared	-	0.67	0.72	-	0.72	0.77	-	0.70
F-stat.	-	59.98	111.66	-	26.83	51.28	-	25.13
								50.51

Notes: Panel A shows the first-stage estimates with LNLSPR as an independent variable. Panel B shows the first-stage regressions for LNPOLFREE. All the variables considered in the second stage are included in the corresponding first stage regressions as well. ***, **, * denote significance at the 1, 5, and 10 percent level, respectively.

Appendix Table 4: First Stage Results of 2SLS Estimates in Tables 6-7

Panel A. Dependent Variable is LNLSPR (Table 6)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
LNSETM		-0.1176 *** (0.0362)			-0.1105 *** (0.0359)			-0.1110*** (0.0378)	
LNCSL			-0.0356 (0.0295)			-0.0199 (0.0380)			-0.0312 (0.0297)
LNHC60		0.5328 *** (0.1232)	0.9927 *** (0.1036)		0.9054 *** (0.2017)	0.8887 *** (0.1867)		0.9250 *** (0.2067)	0.9061 *** (0.1877)
Number of Observations	-	60	87	-	56	82	-	60	87
R-squared	-	0.58	0.62	-	0.61	0.65	-	0.63	0.65
F-stat.	-	39.61	68.21	-	12.59	23.12	-	15.10	24.78

Panel B. Dependent Variable is LNPOLFREE (Table 7)

LNSETM		-0.0531 (0.0452)			-0.0279 (0.0493)			-0.0358 (0.0483)	
LNCSL			-0.0938 ** (0.0385)			-0.0531 (0.0521)			-0.0647 (0.0424)
LNHC60		-1.7525 *** (0.1621)	-1.4289 *** (0.1345)		-1.6067 *** (0.2807)	-1.3430 *** (0.2391)		-1.6352 *** (0.2883)	-1.3403 *** (0.2267)
Number of Observations	-	61	88	-	57	83	-	61	88
R-squared	-	0.67	0.72	-	0.73	0.77	-	0.70	0.76
F-stat.	-	59.98	111.66	-	22.08	42.83	-	20.57	41.74

Notes: Panel A shows the first-stage estimates with LNLSPR as an independent variable. Panel B shows the first-stage regressions for LNPOLFREE. All the variables considered in the second stage are included in the corresponding first stage regressions as well. ***, **, * denote significance at the 1, 5, and 10 percent level, respectively.