

ASSESSING CREDIT RISKINESS

AROUND THE WORLD

by

Jorge Luis Castiblanco Calderon

A thesis submitted in partial fulfillment
of the requirements for the degree

of

Master of Science

in

Applied Economics

MONTANA STATE UNIVERSITY

Bozeman, Montana

August 2014

©COPYRIGHT

by

Jorge Luis Castiblanco Calderon

2014

All Rights Reserved

ACKNOWLEDGMENTS

First and foremost, I am absolutely thankful to the chair of my committee, Professor Myles Watts; this thesis would have never existed without his truly admirable hard work and patience. I also thank my committee members, Professors Joseph Atwood and Sarah Janzen, for their much-needed support and keen suggestions. I am thankful to the Economics Department staff, faculty, and classmates, for their tremendously valuable support throughout my time in the program. Last, but not least, I thank my friends and family, to whom I owe all of my accomplishments. All errors in this manuscript remain the sole responsibility of the author.

TABLE OF CONTENTS

1. INTRODUCTION.....	1
2. BACKGROUND.....	5
Institutions and Financial Performance	7
Investment	9
Foreign Direct Investment (FDI).....	15
Net Interest Margins (NIMs).....	16
Interest Rate Spreads.....	17
Sovereign Credit Ratings (SCRs).....	19
Measures of Insitutional Development	21
Economic Freedom of the World (EFW) Index	22
Alternative Measures of Institutional Development.....	32
Worldwide Governance Indicators (WGI) Index	32
Heritage Foundation Index (IEF)	39
Freedom House Index (FWI)	41
3. THEORY	43
Private Lending Rates and Credit Riskiness	44
The Economic Freedom of the World Index and Institutional Development.....	45
4. DATA	53
Economic Variables	53
Institutional Variables	55
Economic Freedom of the World (EFW) Data	55
Worldwide Governance Indicators (WGI) Data.....	56
Standardization Procedure.....	57
Summarizing and Examining the Data	58
Basic Summary and Examination	58
Data Through Time	62
Data Across Countries.....	69
Multideimensional Visualization.....	77
5. METHODS	86
Core Model Specification.....	88
Sensitivity Analysis	89
Estimation Procedure	89
Endogeneity Concerns.....	93
Sample Selection.....	95

TABLE OF CONTENTS – CONTINUED

Measuring Error.....	98
Variable Selection	98
Aggregation Sensitivity	101
Level, Changes, and Lags.....	104
6. RESULTS	105
Sample N1035	105
Sample N234	110
Sample N1506.....	114
Summary Results	118
7. CONCLUSION	124
REFERENCES CITED	126
APPENDICES.....	136
APPENDIX A: Multicollinearity	137
APPENDIX B: Sample Sensitivity	140
APPENDIX C: Additional Summary Statistics	150
APPENDIX D: Jackknife Procedure.....	161
APPENDIX E: Additional Results	166
APPENDIX F: WGI Data Sources	181

LIST OF TABLES

Table	Page
1. Summary Statistics for the Base Sample.....	59
2. Expected Sign of Regression Coefficients	93
3. Sample Selection	96
4. EFW Index Results under Sample N1035 (GDP Included)	108
5. EFW Index Results under Sample N1035 (GDP Not Included)	109
6. EFW Index Results under Sample N234 (GDP Included).....	112
7. EFW Index Results under Sample N234 (GDP Not Included)	113
8. WGI Index Results under Sample N1506 (GDP Included).....	116
9. WGI Index Results under Sample N1506 (GDP Not Included)	117
10. Summary of Results using the Economic Freedom of the World Index.....	122
11. Summary of Results using the Worldwide Governance Indicators Index	123
12. Condition Numbers	139
13. Country List for Sample N1035.....	152
14. Country List for Sample N234	153
15. Country List for Sample N1506.....	154
16. Summary Statistics for Sample N2002	155
17. Summary Statistics for Sample N1006	155
18. Summary Statistics for Sample N234.....	156
19. Summary Statistics for Sample N1509	156

LIST OF TABLES – CONTINUED

Table	Page
20. Summary Statistics for Sample N1506	157
21. Observations per Year (EFW Samples)	162
22. Observations per Year (Alternative Samples)	163
23. Jackknife Procedure for Sample N1035	165
24. EFW Index Results under Sample N2002 (GDP Included)	167
25. EFW Index Results under Sample N2002 (GDP Not Included)	168
26. WGI Index Results under Sample N2002 (GDP Included)	169
27. WGI Index Results under Sample N2002 (GDP Not Included)	170
28. WGI Index Results under Sample N1035 (GDP Included)	171
29. WGI Index Results under Sample N1035 (GDP Not Included)	172
30. EFW Index Results under Sample N1006 (GDP Included)	173
31. EFW Index Results under Sample N1006 (GDP Not Included)	174
32. WGI Index Results under Sample N1006 (GDP Included)	175
33. WGI Index Results under Sample N1006 (GDP Not Included)	176
34. WGI Index Results under Sample N234 (GDP Included)	177
35. WGI Index Results under Sample N234 (GDP Not Included)	178
36. EFW Index Results under Sample N1506 (GDP Included)	179
37. EFW Index Results under Sample N1506 (GDP Not Included)	180
38. WGI Data Sources (<i>Source</i> : www.govindicators.org)	182

LIST OF FIGURES

Figure	Page
1. Areas, Components, and Sub-components of the EFW Index	26
2. Distribution of the Main Variables	60
3. Correlation Between Private Lending Rates and Institutional Indexes	62
4. Private Nominal Lending Rates Through Time	64
5. Economic Freedom of the World Through Time.....	65
6. Worldwide Governance Through Time.....	66
7. Standardized Means Through Time	68
8. Standardized Median Through Time.....	69
9. Private Lending Rates in 2011	71
10. Economic Freedom of the World in 2011.....	73
11. Worldwide Governance in 2011.....	75
12. Economic Freedom of the World Areas in 2011	78
13. Case Studies	79
14. Index Quartiles and Private Lending Rates.....	81
15. Ten-year Average of Lending Rates and Institutional Indexes.....	85
16. Private Lending Rates in 2011	158
17. Economic Freedom of the World in 2011.....	159
18. Worldwide Governance in 2011.....	160

ABSTRACT

During the last few decades, the theoretical literature highlighting the importance of institutional frameworks on economic performance has exhibited much growth. Furthermore, given that modern advancements have allowed the collection of panel institutional data to become a more reliable procedure, a growing body of empirical research examining several of these theoretical claims has recently begun to flourish. This new empirical literature has given much attention to studying the connection between institutions and economic growth; however, the empirical connection between institutional development and several other important measures of economic performance remains largely unexplored. This thesis partially alleviates this insufficiency by presenting the first empirical study on the relationship between institutional development and private credit riskiness around the world. The analysis consists of applying a variety of model specifications to a select group of panel datasets on institutions. The results obtained suggest that, on average, a higher level of institutional development is associated with interest rate reductions that may, in turn, be due to lower levels of credit riskiness. Moreover, these results appear to be very robust to a wide array of sensitivity tests.

INTRODUCTION

“I intend to demonstrate that the major stumbling block that keeps the rest of the world from benefiting from capitalism is its inability to produce capital. [...] Most of the poor already possess the assets they need to make a success of capitalism. [...] But they hold these resources in defective forms: [...] They have houses but not titles; crops but not deeds; businesses but no statutes of incorporation. It is the unavailability of these essential representations that explains why people who have adapted to every other Western invention, from the paper clip to the nuclear reactor, have not been able to produce sufficient capital to make their domestic capitalism work.” De Soto et al. (2003)

In the book *The Mystery of Capital*, De Soto makes the argument that what is keeping the developing world from being able to tap fully into the benefits of capitalism is the lack of an institutional framework by which to convert assets into *capital*. He argues that the *invisible hand* that allows a citizen of the United States, for instance, to mortgage her house in order to raise capital, or that allows a company to be broken up into several publicly tradable stocks, or that makes it possible for governments to appraise property with agreed-upon rules that hold across neighborhoods, towns, and regions, is simply missing in the developing world.

The work of De Soto can be categorized into the academic branch known as development economics —the body of research in this area is vast and dynamic. Given the nature of data availability, this literature remained overwhelmingly theoretical for decades after its inception; however, the advent of standard economic measures like GDP (Kuznets, 1937; Kravis et al., 1978) and of other macroeconomic variables marked its turning point toward an increasingly empirical literature. The advent of these indicators was of particular relevance because having access to standard measures of

macroeconomic performance allowed economists to begin exploring differences in economic development across nations and, subsequently, to begin examining the underlying causes behind these differences.

In its early days, the empirical work on the determinants of economic development focused on a narrow set of explanatory variables, in part due to the lack of a greater set of reliable and comprehensive measures (Kormendi and Meguire, 1985). However, a sizable body of theoretical literature has long called for the consideration of a wider set of potential determinants of economic performance. North (1989), for instance, argues that the neoclassical model, which for many years served as the basis of economic reasoning for most scholars in the Western world, only holds under the severely restrictive assumption of zero transaction costs; however, under the inclusion of transaction costs, *institutions* begin to play a critical role for economic development.

Institutions, within the realm of economics, are generally understood to encompass the set of rules, enforcement characteristics of rules, and norms of behavior that govern the structural foundation of repeated human interactions (North, 1990). Like North, De Soto and an increasingly growing number of economists have argued in favor of the importance of institutions for economic development.¹ The branch of economics studying the relationship between institutions and economic activity has come to be known as institutional economics.²

The increasing relevance of the theoretical literature on institutions, as well as

¹See Williamson (2000) for an extensive review of this literature.

²A differentiation is made in the literature between the branches known as *institutional economics* and *new institutional economics*. These differences, however, are broadly immaterial for this study.

several modern technological advances, have recently sprung a select variety of comprehensive efforts to measure institutional development around the world; these measures, in turn, have injected a new wave of energy into the field of institutional economics. The motivation for this paper, then, is to harness this newfound energy, and to focus it into becoming an important link in the chain of empirical research on institutions.

The review of the empirical literature presented in Chapter 2 reveals that, though much attention has been paid to studying the connection between institutions and economic growth, the connection between institutional development and several other important measures of economic performance remains largely unexplored. This thesis partially addresses this insufficiency by presenting the first empirical analysis of the relationship between institutional development and private credit riskiness around the world.

In developing this analysis, this study uses the national average of nominal private lending rates, provided by the World Bank, as a proxy for private credit riskiness. As a measure of institutional development, this paper focuses on using the most widely regarded measure of institutional development to date: the Economic Freedom of the World (EFW) index (Gwartney et al., 2013).³ In addition, this research will account for standard economic controls such as inflation, GDP per capita, and global economic trends.

In regard to its methods, this study follows the standard procedures found in the literature, while thoroughly addressing the most popular criticisms applicable to this line of research. In particular, given that most empirical studies on institutional economics to

³See Hall and Lawson (2014) for a comprehensive review of the empirical literature employing the Economic Freedom of the World Index.

date are heavily criticized by the lack of robustness exhibited by their results, this paper devotes much attention to addressing issues like: sensitivity to estimation procedures, sensitivity to sample selection, sensitivity to variable selection, and sensitivity to aggregation methods.

The results obtained in this study suggest that, on average, a higher level of institutional development is associated with interest rate reductions that may, in turn, be due to lower levels of credit riskiness. Moreover, these results appear to be very robust to a wide array of sensitivity tests.

The empirical literature on institutional development is still in its early stages; the literature examining the relationship between institutional development and private credit riskiness is even more so. As such, the results herein presented are offered as an initial step into an admittedly vast and complex literature, in which much work remains to be done.

The balance of this paper is laid out as follows: Chapter 2 provides a contextual background; Chapter 3 lays out the theoretical framework; Chapter 4 describes the data used; Chapter 5 explains the methods applied; Chapter 6 presents the results obtained; and Chapter 7 concludes.

BACKGROUND

“I open my discussion of the new institutional economics with a confession, an assertion, and a recommendation. The confession is that we are still very ignorant about institutions. The assertion is that the past quarter century has witnessed enormous progress in the study of institutions. The recommendation is that, awaiting a unified theory, we should be accepting of pluralism.”
Williamson (2000)

The opening quote of this chapter succinctly contextualizes the current state of the institutional economics literature: In the past forty years there has been much progress in understanding institutions, yet several major questions remain to be formally addressed. This section will present the recent advances in institutional economics of most relevance to assessing private credit riskiness around the world.

Institutional economics is the branch of economics proposing that *institutions* are of central relevance for economic performance. Institutions, in this context, are generally understood to encompass the set of rules, enforcement characteristics of rules, and norms of behavior that govern the structural foundation of repeated human interactions (North, 1990).

The literature on institutional economics can be broadly categorized into two groups: the theoretical and the empirical branches. As mentioned in the introductory chapter, the establishment of the theoretical branch of this literature largely predates the establishment of its empirical branch. However, the recent development of some widely regarded institutional measures, such as the EFW index, has generated a virtual explosion of empirical studies examining the relationship between institutional frameworks and economic performance.

The theoretical literature linking institutional phenomena with economic performance arguably dates back as far as 1937, with the appearance of the seminal work of Coase (1937). Subsequent laudatory examples of the inclusion of institutional frameworks into economic analysis include Coase (1960), Alchian and Demsetz (1972), North (1987), and Olson (1993). More recent popular works such as Acemoglu et al. (2000), Acemoglu et al. (2012) and De Soto et al. (2003) further the theoretical argument supporting the relevance of institutional frameworks on economic performance. On the empirical side, authors like De Soto et al. (2003) and many before him have attempted to measure institutional phenomena in order to test their theoretical arguments. However, sufficient cross-country institutional measures have only become available in the past ten years.

This chapter will begin by examining the body of research linking institutions with various measures of financial performance such as private lending rates, investment, net interest margins, interest rates spreads, and sovereign credit ratings. It will conclude by providing a detailed review of the four major efforts in the literature to measure cross-country institutional development: the Economic Freedom of the World (EFW) index, presented by the Fraser institute (Gwartney et al., 2013); the Worldwide Governance Indicators (WGI), presented by the World Bank and the Brookings Institute (Kaufmann et al., 2011); the Index of Economic Freedom (IEF), presented by the Heritage Foundation and the Wall Street Journal (Miller et al., 2014); and the Freedom in the World Index (FWI), presented by Freedom House (Puddington, 2014).

Institutions and Financial Performance

Before the last two decades, many of the studies examining the determinants of country-level financial performance have focused exclusively on economic indicators (Cuddington, 1987; Greene and Villanueva, 1991; Jaspersen et al., 1995; Serven and Solimano, 1992). However, empirical researchers have begun to recognize that it is not only economic failures in developing countries that lead to a decline in financial performance, but that institutional failures can also produce significant adverse effects. This recent directional change is examined in this section.

The focus of this thesis is on exploring the connection between institutions and *private lending rates*. For the purposes of this study, private lending rates are defined as the nominal bank rates that usually meet the short- and medium-term financing needs of the private sector (World Bank, 2012).

On a theoretical basis, Patterson and Lygnerud (1999) note that, though virtually all economies in the world have monetary authorities attempting to influence domestic lending rates, the actions of these authorities are largely bounded by the following three market forces: the first force is the interaction between the demand for and the supply of money; the second force is inflation, since banks generally expect a real return on their investments; and the third force is credit riskiness, since a higher level of lending risk decreases expected profits. They add that, though real long-term interest rates tend to move together in different economies, nominal rates reflect the inflationary environment in each economy, which in turn reflects the credibility of domestic fiscal and monetary

policies.

On an empirical level, no literature was found connecting institutions with private lending rates; however, the connection between institutions and several related measures of financial performance has been examined in multiple empirical studies. These studies provide a valuable precedent for research on the connection between institutions and private lending rates, and consequently will be the focus of attention for the balance of this section. Most of these studies are of an empirical nature and use Ordinary Least Squares (OLS) as their estimation procedure; the structure of the data analyzed is generally cross-sectional, as reliable panel data on institutional development has only recently become available.

Some of the popular country-level determinants of financial performance explored in this section are: the macroeconomic environment; rights of creditors and the quality of the legal framework; the degree of domestic banking competition; the availability of information about borrowers; domestic taxation policies, including reserve requirements; and banking regulations.

Traditionally, there have been two broad views offered in the literature about what determines how much private credit a financial system will extend to firms and individuals. According to the first view, what matters for the viability of private credit is the power of creditors: when lenders can more easily force repayment, obtain collateral, or even gain control of defaulting firms, they are more willing to extend credit to firms and individuals (Aghion and Bolton, 1992). According to the second view, what matters for lending is information: when lenders know more about borrowers, their credit history, or

other lenders to the firm, they are not as concerned about the ‘lemons’ problem of financing non-viable projects, and therefore extend more credit to firms and individuals (Stiglitz and Weiss, 1981). However, creditor power and information theories are not mutually exclusive; both *ex ante* better information and *ex post* stronger creditor rights can contribute to credit market development (Djankov et al., 2007). In fact there exists a substantial body of both theoretical and empirical research suggesting that the overall institutional infrastructure of an economy, far beyond just legal rights and information, can have a major significant impact on a nation’s overall financial performance. This section, then, examines a broad variety of studies linking institutional development to several measures of country-level financial performance, which in turn provide a solid background for the remainder of this paper.

Investment

By far the most popular measure of country-level financial performance explored in the literature is investment. In the empirical context, investment is generally measured as the ratio of investment to gross domestic product.

Some of the earliest works on the determinants of private investment is Wai and Wong (1982), in which the authors estimate an empirical model for five developing countries to conclude that government investment, the change in bank credit to the private sector, and capital inflow to the private sector play important roles in determining private investment. These results are consistent with those found by Blejer and Khan (1984), who estimate a model for 24 developing countries by using a dataset for private and public

investment to derive two main conclusions: first, they find that changes in bank credit to the private sector have a significant effect on private investment, such that a reduced flow of real credit to the private sector causes real private investment to decline; second, they find that an increase in the infrastructural component of government capital formation raises private investment, but similar increases in other kinds of public investment appear to result in some crowding out.

More recently, studies like Barro (1991) find several measures of institutional instability to be significantly related to cross-country differences in investment. The channel by which institutional instability affects investment is uncertainty. Rodrik (1991), for instance, establishes a theoretical framework arguing that even moderate amounts of institutional uncertainty can act as a hefty tax on investment, and that otherwise sensible reforms may prove damaging if they induce doubts as to their permanence. Aryeetey (1994) applies Rodrik's theoretical framework to a case study of Ghana during the period 1985–1991. He concludes that the poor growth in Ghana's private investment sector during the period 1985–1991 may be attributed to a broad perception of uncertainty in the institutional environment since 1982; the author argues that this uncertainty is derived from the low credibility of investors on government institutions that have been widely unable to assure them that earlier decisions against private wealth will not be repeated. Serven (1997) tests these conjectures empirically through the use of a large panel dataset of mostly Sub-Saharan African countries; he concludes that institutional uncertainty and instability are important factors behind Africa's poor investment record over the last few decades.

Expanding on these findings, Brunetti and Weder (1998) examines a dataset of 60 countries from all regions of the world to conclude that the lack of rule of law, high corruption, and volatility in real exchange rate distortions are the most detrimental institutional factors for investment. Several additional studies have also found empirical evidence in favor of these conclusions. Le (2004), for instance, estimates a private investment equation for a panel of 25 developing countries over 21 years to conclude that low variability of contract enforcement rights and constitutionality promote private investment. Additionally, Mauro (1995) analyzes a cross-section of 60 countries and finds evidence that suggests that corruption has a negative effect on investment. Moreover, Campos et al. (1999) add that it is not only the level of corruption that affects investment but also the nature of corruption. They argue, for instance, that corruption regimes that are more predictable—in the sense that those seeking favors from the government are actually able to obtain said favors—are found to have a lower negative impact on investment than those that are less predictable.

In addition, works like La Porta et al. (1997), use cross-sectional data to show that nations with poorer investor protections, measured by both the character of legal rules and the quality of law enforcement, have smaller and narrower capital markets. Along similar lines, La Porta et al. (1998) mark the beginning of a prolific literature on legal origin and their effects on country-level economic and financial performance. They produce an empirical examination of legal rules covering protection of corporate shareholders and creditors, the origin of these rules, and the quality of enforcement in 49 countries. They arrive at two main conclusions: first, they find that English common law countries

generally have the strongest legal protections of investors, while French civil law countries have the weakest; and second, they find that concentration of ownership of shares in the largest public companies is negatively related to investor protections, which is consistent with the hypothesis that small, diversified shareholders are unlikely to be important in countries that fail to protect their rights.

Levine (1998) furthers this line of research by examining the relationship between country-level legal infrastructures and banking development. Their data indicates that countries where the legal system emphasizes creditor rights and rigorously enforces contracts have better-developed banks than countries where laws do not give a high priority to creditors and where enforcement is lax. Galindo (2001) also finds empirical evidence in favor of these results; he finds that the average credit to GDP ratio for Latin America could double if creditor rights regulations were put in place and law enforcement increased to developing country levels.

Similarly, Clague et al. (1999) analyze a cross-section of 95 countries and several case studies to conclude that the enforceability of contracts and the security of property rights are positively related to investment, and to the relative size of contract-dependent sectors of the economy. These results are consistent with several studies. Besley (1995), for instance, conducts a case study on Ghana from which he concludes that secured property rights facilitate economic transactions between individuals and firms, which in turn enhances the gains from trade and increases the potential returns on investments. In addition, Keefer and Knack (1995) show empirically that indicators of property rights enforcement vary negatively with investment rates across countries. Lastly, Svensson

(1998) uses cross-sectional data for 100 countries to also conclude that institutional quality, particularly through the channel of property rights, has a positive effect on private investment.

Yet more evidence linking legal institutions with financial development comes from Levine (1999), who finds that financial intermediaries are better developed in countries with legal and regulatory systems that give a high priority to creditors receiving the full present value of their claims, enforce contracts effectively, and promote comprehensive and accurate financial reporting by corporations. Very similarly, though more recently and comprehensively, Djankov et al. (2007) use OLS estimation on a cross-sectional dataset of legal creditor rights and private and public credit registries in 129 countries to conclude that both creditor protection through the legal system and information sharing institutions are associated with higher ratios of private credit to GDP, and that the former is relatively more important in richer countries while the latter is relatively more important in developing countries. They complement their OLS estimation with a difference-in-difference approach on legal reforms, and conclude that credit rises after improvements in creditor rights and in information sharing. Lastly, Jappelli and Pagano (2002) use data on private credit bureaus and public credit registers to show that bank lending is higher and credit risk is lower in countries where lenders share information, regardless of the private or public nature of the information sharing mechanism.

A few studies have focused on examining the connection between the overall institutional framework of a country and its investment levels. Alesina and Perotti (1996),

for instance, use cross-sectional data on 71 countries around the world to find that weak economic and political institutions have a negative effect on investment. These results are consistent with Dawson (1998), who uses both cross-sectional and panel data to conclude that a nation's level of institutional development is positively related with investment. Similarly, Feng (2001) analyzes a cross-sectional dataset of 42 countries during the period 1978-1988 to find that high levels of institutional development promote private investment, particularly through the channel of improving human capital formation, while high levels of institutional instability have a negative effect on investment; these results hold even after controlling for both domestic and international economic conditions.

Yet another set of studies has focused on investigating the connection between democracy and investment. Pastor Jr and Hilt (1993), for instance, study a cross-sectional sample of Latin American countries to conclude that the legitimacy and long-term stability provided by democratic systems promote private sector confidence and thereby investment. These results are subsequently corroborated through the use of panel data by studies like Pastor Jr and Sung (1995) and Feng (2001).

On a similar line, Ozler and Rodrik (1992) examine a cross-section of 32 countries over the period 1975-1985 to conclude that political systems that encourage the provision of political rights are conducive to superior private investment behavior. Further, Ozler and Rodrik (1992) find evidence to suggest that domestic politics can magnify or dampen the effect of external financial shocks. In regard to this last point, Galindo (2001) finds creditor rights play an important role on investment by exacerbating credit risk in countries where creditor rights are not protected, and hence inducing an overreaction of

credit markets to exogenous shocks.

Foreign Direct Investment (FDI)

Another popular measure of country-level financial performance explored in the literature is foreign direct investment (FDI). The results yielded by this body of research are consistent with previously discussed findings. Schneider and Frey (1985), for instance, estimate an empirical model for a sample of 80 less developed countries, and conclude that institutional instability has a significant negative effect on FDI inflows.

Similarly, Busse and Hefeker (2007) examine a dataset of 83 developing countries covering the period 1984-2003 to identify indicators that matter most for the activities of multinational corporations; their results suggest that government stability, internal and external conflict, corruption and ethnic tensions, law and order, democratic accountability of government, and quality of bureaucracy are highly significant determinants of foreign direct investment inflows. These results are consistent with Globerman and Shapiro (2002), who study a cross-section of 144 countries around the world during the period 1995–1997 to conclude that governance infrastructure is an important determinant of both FDI inflows and outflows.

Additionally, several studies have examined the connection between democracy and foreign direct investment (Busse, 2003; Jensen, 2003; Li and Resnick, 2003; Jakobsen and De Soysa, 2006; Li, 2009; Asiedu and Lien, 2011). The results on this topic are mixed, as democratic institutions are found to have conflicting effects on FDI inflows: on the one hand, democratic institutions hinder FDI inflows by allowing domestic firms to

pursue protection from foreign capital; on the other hand, democratic institutions promote FDI inflows because they tend to ensure more credible property rights protection thereby reducing risks and transaction costs for foreign investors. Li and Resnick (2003) test these hypotheses empirically by examining fifty-three developing countries from 1982 to 1995; he concludes that: first, both property rights protection and democracy-related property rights protection encourage FDI inflows; second, after controlling for property rights protection, democratic institutions reduce FDI inflows.

Lastly, Smarzynska (2004) uses a unique firm-level dataset from Eastern Europe and the former Soviet Union to find that a weak protection of intellectual property rights deters foreign direct investment in technology-intensive sectors.

Net Interest Margins (NIMs)

Another measure of country-level financial performance explored in the literature is net interest margins. In this context, net interest margins (NIMs) are defined as the total difference between interest earned and interest paid by a financial institution.

Saunders and Schumacher (2000), for instance, examine bank-level data in six selected European countries and the US during the period 1988–1995 in order to study the determinants of bank net interest margins. They find regulation, in the form of interest rate restrictions on deposits, reserve requirements and capital-to-asset ratios, has a significant impact on banks NIMs. Similarly, Gelos (2009) examines determinants of bank interest margins using cross-sectional bank- and country-level data from 85 countries; he finds that inflation, bank profit taxation, and reserve requirements have a significantly negative

impact on spreads.

These results are consistent with Demirguc-Kunt and Huizinga (1999), who examine bank-level data for 80 countries during the period 1988-95 to conclude that a larger bank asset-to-GDP ratio and a lower market concentration ratio lead to lower margins and profits, even after controlling for differences in bank activity, leverage, and macroeconomic environment. They expand on these results in Demirguc-Kunt et al. (2003), where the authors use bank-level data across 72 countries to arrive to six conclusions worth mentioning: first, tighter regulations on bank entry and bank activities increase the cost of financial intermediation; second, inflation exerts a robust, positive impact on bank margins and overhead costs; third, though concentration is positively associated with net interest margins, this relationship breaks down when controlling for regulatory impediments to competition and inflation; fourth, bank regulations become insignificant when controlling for national indicators of economic freedom or property rights protection; fifth, institutional indicators robustly explain cross-bank net interest margins and overhead expenditures; and sixth, bank regulations cannot be viewed in isolation, as they reflect broad, national approaches to private property and competition.

Interest Rate Spreads

Yet another measure of country-level financial performance explored in the literature is interest rate spreads. In this context, interest rate spreads are defined as the difference between the lending and the saving rates offered by a financial institution.

Some authors prefer to use interest rate spreads over net interest margins in

examining financial performance. Laeven and Majnoni (2005), for instance, argue that: first, net interest margins are typically expressed in terms of total assets, while for a correct construction of interest rate spreads only interest income should be related to bank assets, and interest payments should be related to bank liabilities; second, net interest margins typically do not control for the presence of non-interest-earning assets such as non-performing loans; and third, net interest margins are typically based on total interest income, which also includes interest from non-lending operations, therefore limiting comparability across banks.

In their empirical analysis, Laeven and Majnoni (2005) investigate the effect of judicial efficiency on banks' lending spreads for a cross-section of 106 countries; they conclude that judicial efficiency and inflation rates are the main drivers of interest rate spreads across countries. Their work is closely related to Bae and Goyal (2003), who examine how property rights affect the pricing of international bank loans; they find that banks charge higher loan rates in countries with weaker property rights.

Similarly, Jappelli et al. (2005) argue that improvements in judicial efficiency should reduce credit constraints and increase lending, with an ambiguous effect on interest rates that depends on banking competition and on the type of judicial reform; they examine these claims empirically by using panel data on Italian provinces. Their findings suggest that credit is less widely available in provinces with longer trials or with large backlogs of pending trials.

Lastly, Ozler (1992) examines loan-level for the expansion stage of the Eurocurrency market covering the period 1968–1981 to find a significantly negative

relation between the experience level of a borrower and the variation of interest spreads.

Sovereign Credit Ratings (SCRs)

This section ends by examining the connection between institutions and sovereign credit ratings (SCR). The SCR literature is of relevance to this study because it represents a natural sovereign-level analogue to the hypothesis tested by this study. In other words, while average national private lending rates can be seen as a proxy for national private credit riskiness, sovereign credit ratings can be seen as a proxy for sovereign credit risk.

In summary, the results presented by this literature suggest that nations with higher levels of institutional development enjoy significantly lower sovereign costs of borrowing. These findings, in turn, are in line with the central hypothesis of this study; in other words, the conclusion that cross-country institutional development and sovereign credit rates are inversely related is in many ways analogous with the argument that cross-country institutional development and private lending rates may exhibit an inverse relationship.

Like other credit ratings, sovereign ratings are assessments of the relative likelihood that a borrower will default on its obligation. SCRs determine the cost of capital for sovereign nations. Hence, lender perceptions of credit risk in sovereign lending are of central importance because these perceptions affect both the supply and cost of money. Given their increasing importance, the study of the determinants of sovereign credit ratings has gained much attention during the past two decades. Cantor and Packer (1996), for instance, find that of the large number of criteria used by Moody's and Standard and Poor's in their assignment of sovereign ratings, six factors appear to play an

important role in determining a country's rating: per capita income, GDP growth, inflation, external debt, level of economic development, and default history; while no systematic relationship is found between ratings and either fiscal or current deficits.

In addition, Brewer and Rivoli (1990) conclude that institutional variables are at least as important as economic variables in explaining perceived country creditworthiness. Similarly, Butler and Fauver (2006) use a sample of 86 countries to examine the cross-sectional determinants of sovereign credit ratings; the results of their study suggest that the quality of a country's legal and political institutions have a strong positive effect on credit ratings, even after controlling for factors like GDP per capita, inflation, foreign debt per GDP, previous defaults, and general development. In addition, they find that legal origin does not have a significant impact on credit ratings, after controls are included.

In a similar study, Jensen (2003) uses panel data for more than 100 countries during the period 1970-1997 to conclude that even after controlling for economic factors, democratic institutions are generally associated with higher levels of country credibility and lower levels of sovereign default risk. These results are consistent with Vaaler et al. (2005), who find that bondholders perceive higher investment risk in the form of higher credit spreads on their sovereign bonds as right-wing political incumbents appear more likely to be replaced by left-wing challengers, and vice versa.

On the other hand, Saiegh (2005) finds that democracies are more likely to reschedule their debts, though his data do not suggest any empirical regularities suggesting that regime type has a significant effect on sovereign interest rates. These results are consistent with Candace et al. (2007), who use panel data for 50 developing

countries from 1987 to 2003 and interviews to conclude that, while controlling for the common factors in the literature, regime type and most other political institutions have little effect on bond raters. Instead, trade, inflation, growth, and bond default strongly affect sovereign ratings.

Lastly, Roychoudhury and Lawson (2010) use panel data for 93 countries for the period 2000-2006 to conclude that institutional development is inversely related to sovereign debt risk, even after controlling for economic performance indicators. Moreover, they conclude that nations with higher EFW index ratings enjoy significantly lower sovereign costs of borrowing.

Measures of Institutional Development

An empirical analysis can only be as good as the data it uses. For this reason, this section devotes a substantial amount of attention to reviewing and examining the institutional measures available in the literature.

One particular measure that has gained central attention in the academic literature is the Economic Freedom of the World (EFW) index, published by the Fraser Institute (Gwartney et al., 2013). Even though alternative indexes of cross-country institutional development have been constructed, the EFW index has become the measure of choice in most empirical studies on institutions (Heckelman and Stroup, 2005; Doucouliagos, 2005; De Haan et al., 2006). The reasons behind the academic favoritism of the Economic Freedom of the World index over alternative measures of cross-country institutional strength are further developed below.

The following subsections present and examine the four major efforts in the literature to measure cross-country institutional development: (1) the Economic Freedom of the World (EFW) index, presented by the Fraser institute (Gwartney et al., 2013); (2) the Worldwide Governance Indicators (WGI), presented by the World Bank and the Brookings Institute (Kaufmann et al., 2011); (3) the Index of Economic Freedom (IEF), presented by the Heritage Foundation and the Wall Street Journal (Miller et al., 2014); and (4) the Freedom in the World Index (FWI), presented by Freedom House (Puddington, 2014).

Economic Freedom of the World (EFW) Index

“Freedom is a big word, and economic freedom not much smaller. To talk about economic freedom is easy; to measure it, to make fine distinctions, assign numbers to its attributes, and combine them into one overall magnitude — that is a very different and much more difficult task.” Milton Friedman in the foreword to the first publication of the Economic Freedom of the World index (Gwartney et al., 1996).

The Economic Freedom of the World (EFW) index, presented by the Fraser Institute, is part of a group of institutional indicators that seek to measure institutional development by focusing on the concept of *economic freedom*. Economic freedom, in this context, is broadly defined as the degree to which an economy fosters the frictionless functioning of the markets by means of supporting institutional frameworks that uphold personal choice, voluntary exchanges, freedom to enter and compete, and the protection of persons and property from transgression by others (Gwartney et al., 2013).

Although a few other indexes exist in the literature that seek to measure institutional development across the world, the popularity of the EFW index among

empirical researchers is unrivaled (Berggren, 2003; De Haan et al., 2006; Hall and Lawson, 2014). This subsection examines the relevant literature of the EFW index: First, a brief history and description of the EFW index is presented; second, the methodological cornerstones and procedures behind the production of the index are outlined; and third, some of the main criticism of the index and of its utilization in the empirical literature are discussed.⁴

The first published volume of the EFW index represented the culmination of a process that began at the 1984 meetings of the Mont Pelerin Society, in Cambridge, England. This process was an ongoing effort for 20 years, throughout which as many as 61 scholars, including Milton Friedman, Gary Becker, Armen Alchian and Douglas North, discussed ideas together to compile a dataset on cross-country institutional development that eventually became the most ambitious to date (Gwartney et al., 1996).

From its onset, the EFW index set itself apart from similar existent measures. As Michael A. Walker, one of the original collaborators of the EFW project and founder of the Fraser Institute puts it, there are two main ways in which a worldwide index of institutional development could be constructed: “The ‘low tech’, judgmental way in which a number of individuals are asked to provide their subjective ranking of a group of countries, and the ‘high tech’ way in which a large number of criteria, based on a series of measurable quantities, are applied to produce the rating.” (Gwartney et al., 1996) The EFW data have come to embody the ‘high tech’ way of constructing the index, as the objectification of the measurement process circumvents many subjectivity issues and the

⁴The theory and methodology behind the EFW index are discussed in further depth in Chapters ?? and 5, respectively.

difficulty of finding truly knowledgeable individuals to do the rating. These attributes, in turn, have become some of the index's most valuable assets for empirical research.

As of the last publication of the Economic Freedom of the World report, the EFW index covers 152 countries and territories and has data dating as far back as 1970 (Gwartney et al., 2013). The data are available every five years for the period of 1970-2000 and on a yearly basis for the period of 2000-2011.

In theory, these data make it possible for scholars to analyze the impact of cross-country differences in economic freedom as well as changes in economic freedom throughout a three-decade time frame. In practice, however, these data exhibit non-negligible inconsistencies from year to year that make time series analyses using the EFW index more reliable after the year 2001. Prior to 2002, the set of countries for which the data is presented were inconsistent, the aggregation techniques used to derive summary index measures changed, and the institutional components being measured by the index were modified (Berggren, 2003; De Haan et al., 2006).

The 2013 Economic Freedom of the World report outlines four cornerstones of the index: personal choice, voluntary exchange coordinated by markets, freedom to enter and compete in markets, and protection of persons and their property from transgression by others. The construction of the index is based on three important methodological principles:

“First, objective components are always preferred to those that involve surveys or value judgments. Given the multi-dimensional nature of economic freedom and the importance of legal and regulatory elements, it is sometimes necessary to use data based on surveys, expert panels, and generic case studies. To the fullest extent possible, however, the index uses objective components. Second,

the data used to construct the index ratings are from external sources such as the International Monetary Fund, World Bank, and World Economic Forum that provide data for a large number of countries. Data provided directly from a source within a country are rarely used, and only when the data are unavailable from international sources. Importantly, the value judgments of the authors or others in the Economic Freedom Network are never used to alter the raw data or the rating of any country. Third, transparency is present throughout. The report provides information about the data sources, the methodology used to transform raw data into component ratings, and how the component ratings are used to construct both the area and summary ratings.” Gwartney et al. (2013)

Figure 1 illustrates the structure of the EFW index. The index assesses economic freedom by measuring five major areas: (1) size of government; (2) legal system and property rights; (3) sound money; (4) freedom to trade internationally; and (5) regulation. Each major area is comprised of several components that in turn are made up of a few sub-components. In total, the index spans 42 distinct institutional variables. Each component and sub-component is transformed onto a scale from 0 to 10, reflecting the distribution of the underlying data. When sub-components are present, the sub-component ratings are averaged to derive a summary component rating. Subsequently, the component ratings within each area are then averaged to derive a summary rating for each of the five main areas. Lastly, the five area ratings are averaged to derive an overall summary EFW rating for each country and year.

Throughout the past decade, empirical research on the effect of institutions on economic performance has seen a virtual explosion. The main institutional measure responsible for the dramatic increase in the volume of this literature is the EFW index. The unrivaled praise for this index includes that of figures like Milton Friedman, who stated that “this measurement of economic freedom is an enormous improvement over

Figure 1: Areas, Components, and Sub-components of the EFW Index

1. Size of Government

- | | |
|--|---|
| A. Government Consumption | D. Top marginal tax rate |
| B. Transfers and subsidies | (i) Top marginal income tax rate |
| C. Government enterprises and investment | (ii) Top marginal income and payroll tax rate |

2. Legal System and Property Rights

- | | |
|--|---|
| A. Judicial independence | F. Legal enforcement of contracts |
| B. Impartial courts | G. Regulatory restrictions on the sale of real property |
| C. Protection of property rights | H. Reliability of police |
| D. Military interference in rule of law and politics | I. Business costs of crime |
| E. Integrity of the legal system | |

3. Sound Money

- | | |
|------------------------------------|--|
| A. Money growth | D. Freedom to own foreign currency bank accounts |
| B. Standard deviation of inflation | |
| C. Inflation: most recent year | |

4. Freedom to Trade Internationally

- | | |
|--|---|
| A. Tariffs | C. Black-market exchange rates |
| (i) Revenue from trade taxes (% of trade sector) | D. Controls of the movement of capital and people |
| (ii) Mean tariff rate | (i) Foreign ownership/investment restrictions |
| (iii) Standard deviation of tariff rates | (ii) Capital controls |
| B. Regulatory Trade Barriers | (iii) Freedom of foreigners to visit |
| (i) Non-tariff trade barriers | |
| (ii) Compliance costs of importing and exporting | |

5. Regulation

- | | |
|---|---------------------------------------|
| A. Credit market regulations | C. Business regulations |
| (i) Ownership of banks | (i) Administrative requirements |
| (ii) Private sector credit | (ii) Bureaucracy costs |
| (iii) Interest rate controls/negative real interest rates | (iii) Starting a business |
| B. Labor market regulations | (iv) Extra payments/bribes/favoritism |
| (i) Hiring regulations and minimum wage | (v) Licensing restrictions |
| (ii) Hiring and firing regulations | (vi) Cost of tax compliance |
| (iii) Centralized collective bargaining | |
| (iv) Hours regulations | |
| (v) Mandated cost of worker dismissal | |
| (vi) Conscription | |

anything that has so far appeared. We are all in debt to the authors for the persistence and hard work that has gone into this extraordinary comprehensive collection and analysis of data.” (Gwartney et al., 1996) In addition, arguably the most prominent theorist in modern institutional economics, Douglas C. North, has backed the use of the EFW index by asserting that it “provides convincing evidence of the relationship between the institutions that underlie economic freedom and the performance of economies.” (Gwartney et al., 1996) Last but not least, the hundreds of academic studies that have chosen to use the EFW index as a core variable in their research have given this index their vote of academic approval.

Several works reviewed the EFW literature in some way or another. Hall and Lawson (2014), for instance, conclude that the overwhelming balance of the evidence presented by the empirical literature suggests that institutional development (as measured by the EFW index) corresponds with a wide variety of positive socioeconomic outcomes and yields almost no negative tradeoffs. Their study considers 402 articles that cite the EFW; of those 402 articles, central attention is given to the 198 articles that also use the index as an independent variable in an empirical study.

Other relevant studies surveying the EFW literature are De Haan et al. (2006) and Doucouliagos (2005). These two studies are less comprehensive than Hall and Lawson (2014), but they provide greater insight into the most common empirical methods used in the literature to link the EFW index to several indicators of economic performance. They conclude that: (1) the majority of the studies use cross-sectional data; (2) the average sample size is 126 observations from 68 different countries; (3) most studies use data that

cover at least the 1975–1990 period; (4) most of the studies use a single equation estimation methodology; (5) most of the studies use the levels of the EFW index as a regressor, as opposed to changes or growth rates; and (6) most of the studies do not test the robustness and sensitivity of their results.

De Haan et al. (2006) and Doucouliagos (2005) also present the most common criticisms of the EFW index and of its use in the empirical literature. All of the major criticisms are due to the lack of robustness of the results; the results are claimed to be sensitive to: (1) the estimation procedure; (2) alternative sample choices; (3) the selection of the functional form of the EFW index (level, change, or lag) to be included in the statistical model; (4) measuring error; (5) variable selection; and (6) the process used for aggregating the institutional measures.⁵

The first three criticisms are common to most of the empirical literature on institutions; estimation procedures, sample choices, and the functional form of the regressors, are all problems that are well-documented in the literature (Greene and Villanueva, 1991; Przeworski and Limongi, 1993; De Haan and Sturm, 2000; Lawson, 2006). In the context of this study: (1) failing to account for unobserved heterogeneities across countries, for instance, is a concern given the numerous country-specific characteristics not being controlled for in the model that might have a significant effect on private lending rates; (2) considering only one sample in the statistical analysis is a concern given the reduced scope of inference of the results that doing so would represent; and (3) lacking due care in specifying the functional form of the regressors is a concern

⁵Doucouliagos (2005) also presents concerns about publication bias in the empirical literature on economic freedom; Hall and Lawson (2014), however, do not find evidence to substantiate this claim.

since it dramatically alters the underlying structure of the regression estimators. Given that these issues are not specific to the EFW literature, they will not be discussed here at great length; they will, however, be revisited from a methods perspective in Chapter 5.

The last three criticisms, on the other hand, are central concerns for institutional measures like the EFW index. The main issues with regard to measuring error stem from two sources: (1) the ideological bias of the producers of the index; and (2) the inherent difficulty associated with measuring institutional phenomena. Though, these are legitimate concerns to consider, the ease of tractability of the variables composing the EFW index make the process transparent and difficult to manipulate (De Haan et al., 2006; Berggren, 2003). In addition, the EFW index is by far the most objective of all the available measures of cross-country institutional development, by construction. In addressing this later issue, Milton Friedman writes:

“To achieve [its] advantages, it was essential that the [EFW] not beg any questions by depending on outcomes; it was essential that it depend only on objective characteristics of an economy. This may seem obvious but I assure you that it is not. After all, the rate of economic growth or the level of living may be an excellent proxy for economic freedom, just as an auto’s maximum speed may be an excellent proxy for the power of its motor. But any such connections must be demonstrated not assumed or taken for granted. There is nothing in the way the index is calculated that would prevent it from having no correlation whatsoever with such completely independent numbers as per capita GDP and the rate of growth of GDP.” Gwartney et al. (1996)

The issues regarding variable selection and the aggregation process go hand in hand, and these are also concerns affecting all available measures of cross-country institutional development. Institutionalism is a broad concept; measuring it comprehensively requires considering a wide range of phenomena. The possible

institutional phenomena affecting any given dependent variable such as GDP (or, in the case of this study, private lending rates) can be upward of 50 (Levine and Renelt, 1992); thus, choosing which indicators to include in an empirical model and which ones to leave out is not a straightforward process. Whether this decision is left to some obscure statistical technique or to the discretion of the constructors of the index, this decision is susceptible to subjectivity and omitted variable bias concerns (Lawson, 2006).

Aggregating the data, on the other hand, reduces the concern for subjectivity in the variable selection process as well as the concern for omitted variable bias; however, it generates doubts about the validity of aggregating variables that may present a broad degree of heterogeneity, as well as concerns about the sensitivity of the results to different aggregation methods (Heckelman and Stroup, 2005).

One popular method for aggregating data used in the literature is principal component analysis (PCA). PCA is a statistical procedure that seeks to summarize the most information from a set of strongly correlated independent variables into a smaller set of variables called components (Greene, 2003). This procedure is suggested by Sturm et al. (2002) as a solution to the multicollinearity issues that arise when including the EFW areas and components as independent variables in a regression model. Some older publications of the EFW report also presented indexes aggregated by means of a PCA procedure (see, for instance, Gwartney et al. (2001)), which could be argued to lend additional support to the idea that perhaps the overall EFW summary index should be derived by means of PCA, as opposed to simple averages.

However, the principal components methodology has its own inherent

shortcomings as a method of aggregation:

“First, the results are quite sensitive to the scale of measurement in the variables. The obvious remedy is to standardize the variables, but unfortunately, this has substantial effects on the computed results. Second, the principal components are not chosen on the basis of any (theoretical) relationship of the regressors to Y, the variable we are attempting to explain. Lastly, the calculation makes ambiguous the interpretation of the results. The principal components estimator is a mixture of all of the original coefficients. It is unlikely that we shall be able to interpret these combinations in any meaningful way.” Greene (2003)

To these criticisms by Greene, Heckelman and Stroup (2005) add that, since the weights used in principal component analysis are data-dependent, the results obtained when aggregating the EFW data by means of PCA are quite sensitive to the particular set of countries included in the sample, and even to the number of principal components selected by the researcher to be included in the estimation model. Furthermore, it is worthwhile noting that the authors of the Economic Freedom of the World index have decided against PCA as an aggregation procedure in favor of simple averages on all their publications since 2002:

“Although principal component analysis has the advantage of being value-neutral, it does create problems of its own. In particular, when two components are closely correlated, as often happens, then principle component analysis tends to assign low weights to one or both of these components. In essence, the principle component analysis wants to drop out the interrelated components. But, we often want to include these components even if they are correlated with other components in order to offset measurement error in the data and to increase the number of countries we can rate. We have, therefore, decided to return to using a simple average to combine the components into area ratings and the area ratings into summary ratings.” Gwartney and Lawson (2002)

Overall, and despite these criticisms, the institutional literature generally agrees that the Economic Freedom of the World index has added significant value to the

economics profession. Moreover, its overwhelming popularity among institutional empiricists is clear by any account of the literature (Heckelman and Stroup, 2005; De Haan et al., 2006; Hall and Lawson, 2014).

Alternative Measures of Institutional Development

The major alternative measures of cross-country institutional development employed in the literature are: (1) the Worldwide Governance Indicators (WGI), presented by the World Bank and the Brookings Institute (Kaufmann et al., 2011); (2) the Index of Economic Freedom (IEF), presented by the Heritage Foundation and the Wall Street Journal (Miller et al., 2014); and (3) the Freedom in the World Index (FWI), presented by Freedom House (Puddington, 2014). This section explores each one of these three alternative indexes. These indexes are explored to a lesser degree, proportional to their relevance to this study.

Worldwide Governance Indicators (WGI): The previous subsection presented the most popular measure of country-level institutional development in the empirical literature: the Economic Freedom of the World index. The EFW index measures institutional development by focusing on the concept of economic freedom. Though measuring economic freedom has become a popular way of assessing the level of institutional development for countries across the world, some alternative measures exist. The Worldwide Governance Indicators (WGI) from the World Bank and the Brookings institute, for instance, attempts to assess empirically the level of institutional development for countries across the world by focusing on another popular concept in the literature:

governance.⁶ In this context, governance is generally understood as:

“The traditions and institutions by which authority in a country is exercised. This includes (1) the process by which governments are selected, monitored and replaced; (2) the capacity of the government to effectively formulate and implement sound policies; and (3) the respect of citizens and the state for the institutions that govern economic and social interactions among them.” Kaufmann et al. (2011)

The WGI dataset is summarized into six aggregate indicators of institutional development: *voice and accountability*, *political stability and absence of violence*, *government effectiveness*, *regulatory quality*, *rule of law*, and *control of corruption*. These indicators were first published in 1999 (Kaufmann et al., 1999), and they represent the views of enterprises, citizens and experts surveyed across roughly 200 countries. Data are available every other year during the time period spanning 1996-2002; for the time period spanning 2002-2012, data are available yearly (Kaufmann et al., 2011).

Throughout the past decade, the WGI have become the most frequently used measure of governance for academics and policy makers alike (Arndt and Oman, 2006; Gray, 2007; Kurtz and Schrank, 2007a). The careful construction of the indicators, their global coverage, and the claim that they achieve maximum precision make the indicators appealing to researchers (Thomas, 2010). Furthermore, the fact that these indicators are produced by World Bank researchers and are financed and publicized by the World Bank lends them an added degree of authority among cross-country assessments of institutional development. Gray (2007) adds that the Worldwide Governance Indicators are also an important improvement in governance data insofar as they summarize information from a

⁶The WGI dataset is also known in the literature as KKZ, from the initials of the names of its three original authors.

broad set of sources, and they publish margins of error for each of the six indicators thereby making explicit the inherent degree of uncertainty in measuring institutional strength.

The choice to aggregate institutional data from a wide variety of sources is based on the view that the resulting aggregate indicators decrease measuring error and increase the contained level of information about unobserved governance, relative to any individual data source (Kaufmann et al., 2009). Langbein and Knack (2010), for instance, explain that errors may be correlated among sources, but so long as there is some idiosyncratic or source-specific error, the resulting indicators may be more accurate than any randomly-selected single source. The authors of the WGI thoroughly report the procedures they followed in the aggregation of their data. Each individual dataset used in their compilation is presented on the project's website, along with the aggregation procedures and weights employed. Even occasional critics of the dataset, like Langbein and Knack (2010), highlight these efforts of transparency as a valuable measure for empirical researchers.

In the United States, a prominent example of an agency that relies on the WGI for its public policy analysis is the Millennium Challenge Corporation (MCC) (Thomas, 2010); abroad, donor governments like the Netherlands rely on the WGI as a means to monitor the quality of governance in aid-recipient countries (World Bank, 2006). In the academic arena, Thomas (2010) and Arndt and Oman (2006) present a list of several of the most popular works using the WGI for empirical research. One of the most widely cited empirical studies using the WGI is Kaufmann and Kraay (2002), which uses the

Worldwide Governance Indicators to find a strong positive causal effect from governance on development outcomes. Studies like Méon and Sekkat (2005) corroborate these results. Lastly, studies along the lines of Globerman and Shapiro (2002) use the WGI to conclude that governance is a major determinant of foreign direct investment.

Despite this popularity in academia and in public policy analysis, several concerns have been brought up regarding the Worldwide Governance Indicators. The two most popular criticisms in the literature are: (1) the overall subjectivity of the data (Arndt and Oman, 2006; Knack, 2006; Kurtz and Schrank, 2007b; Langbein and Knack, 2010; Thomas, 2010); and (2) the strong correlation among the six aggregate indicators presented in the dataset (Brewer et al., 2007; Langbein and Knack, 2010).⁷ As noted in the Economic Freedom of the World index subsection, these two concerns are not unique to the WGI dataset; rather, they reflect the inherent difficulty of measuring institutional development across the world. However, there are some relevant discussions about these concerns that are particular to the WGI.

The first major criticism of the WGI dataset is due to the overall subjectivity of the data. These concerns arise as the result of two main causes: (a) the data collection methodology; and (b) the procedure by which the data are aggregated into the final six summary indicators. The collection method has raised some concerns because the WGI is the result of compiling over 400 variables produced by more than 30 sources across the world (Kaufmann et al., 2009), and the choice of sources included in the compilation of

⁷For a thorough discussion of all WGI criticisms in the literature, as well as for a reply to each one of these criticism by the authors of the dataset, see Kaufmann et al. (2007a).

the final indicators is subjective.⁸ Furthermore, unlike the EFW dataset, many of the variables used in the compilation of the WGI are not based on standard economic theory, but rather on the perceptions of enterprises, citizens and so-called experts (Thomas, 2010).

The second source of subjectivity regarding the WGI arises from the procedure by which the data are aggregated into six summary indicators. The concern in the literature is that some of the WGI indicators overlap to the point that assigning a set of variables to a particular summary indicator over another becomes a rather arbitrary endeavor. Thomas (2010), for instance, complains that both the choice of the six WGI indicators and the contents mapped to each one of them were determined purely by the beliefs of the WGI authors about governance. Langbein and Knack (2010) echo these concerns: they suggest that the WGI report would benefit from providing an empirical reason for the aggregation of the governance measures into the six indicators selected by the authors.

Kaufmann and Kraay (2008) respond to all of these subjectivity concerns by admitting that, just like it is the case for any alternative measure of institutional development, the choice of which data to include in the WGI dataset is subjective. However, they point out that guidelines like complementarity, comprehensiveness, and having an international source are closely followed in determining which variables to include in the final dataset. Furthermore, the authors of the WGI defend their choice to

⁸For a detailed list of the various sources used in the compilation of the WGI dataset throughout the years, see Table ?? in Appendix F. Special attention is drawn to two sources: the Heritage Foundation's Index of Economic Freedom (IEF), and Freedom House's Freedom in the World Index (FWI). As mentioned above, these two indexes represent the two other major alternative efforts to measure institutional strength comprehensively around the world. The fact that the WGI consistently include data from these two sources is of relevance because it implies that, when using the WGI dataset as a measure of institutional development, the researcher is also able to take into consideration such relevant indexes in the literature as the IEF and the FWI, without allowing their shortcomings to fully determine the outcome of the final empirical measures to be employed in his or her analysis.

rely on perceptions-based data by stating that:

“First and most basic, perceptions matter because agents base their actions on their perceptions, impression, and views. If citizens believe that the courts are inefficient or the police are corrupt, they are unlikely to avail themselves of their services. Similarly, enterprises base their investment decisions - and citizens their voting decisions - on their perceived view of the investment climate and the government’s performance. Second, in many areas of governance, there are few alternatives to relying on perceptions data. This is most particularly so for the case of corruption, which almost by definition leaves no ‘paper trail’ that can be captured by purely objective measures. Third, we note that even when objective or fact-based data are available, often such data may capture a *de jure* notion of laws ‘on the books’ that differs substantially from the *de facto* reality that exists ‘on the ground’.”⁹ Kaufmann et al. (2011)

In addition to these subjectivity concerns, Kaufmann et al. (2011) explore some other concerns that may arise from the perceptions-based nature of the data; more specifically, they address concerns regarding systematic bias. First, the authors explore whether different types of respondents differ systematically in their perceptions of the same underlying reality (Kaufmann et al., 2007b). Second, they explore whether the ideological orientation of the organization providing the subjective assessments of governance introduces significant biases to the indicators (Kaufmann et al., 2004). Third, they explore whether the subjective assessments of governance are driven by factors other than governance itself, such as the level of development or recent economic performance of a country (the so-called ‘halo effect’) (Kaufmann et al., 2007b). Lastly, they explore whether different providers of governance perceptions data rely on each other’s assessments, and as a result make correlated perceptions errors (Kaufmann et al., 2007c).

⁹See Aron (2000), Hallward-Driemeier et al. (2010), and Voigt (2013) for additional sources validating the third point put forth by the authors of the WGI.

They conclude that none of these concerns for systematic bias withstand their empirical scrutiny.

The second major criticism of the WGI dataset stems from the strong statistical correlation among its six aggregate indicators. The concern in the literature is that, though each indicator is in fact seen as a measure of institutional strength, there is so much overlap among them that they cannot distinctly capture the six areas of governance that they purport to measure. On theoretical grounds, for instance, Langbein and Knack (2010) argue that indicators like *government effectiveness* are so “broad, vague and heterogeneous” that it is difficult to distinguish them from other aspects of governance. Furthermore, their study presents some empirical evidence supporting these claims.

The authors of the WGI acknowledge the close interplay among their indicators, but rather see this phenomenon as reassurance of the fact that each indicator is measuring a facet of institutional development. They note:

“[T]hese six dimensions of governance should not be thought of as being somehow independent of one another. One might reasonably think for example that better accountability mechanisms lead to less corruption, or that a more effective government can provide a better regulatory environment, or that respect for the rule of law leads to fairer processes for selecting and replacing governments and less abuse of public office for private gain. In light of such interrelationships, it is not very surprising that our six composite measures of governance are strongly positively correlated across countries.” Kaufmann et al. (2011)

Given these close interrelationships, several studies have opted for aggregating the data into one single summary index produced by averaging together all six WGI indicators (Easterly, 2002; Al-Marhubi, 2004; Bjornskov, 2006; Arndt and Oman, 2006; Beltratti and Stulz, 2009). This approach is designed as a way of dealing with the several empirical

issues that can arise from including such closely correlated variables into a statistical model.¹⁰ Moreover, this approach is consistent with the approach favored by the EFW literature, and will hence be adopted for the empirical analysis conducted in this paper.

In summary, the Worldwide Governance Indicators represent the second most widely used measure of cross-country institutional development in the literature. Though they have been criticized due to subjectivity and aggregation concerns, these issues are not unique to this dataset but rather a broad reflection of the inherent difficulty of capturing institutional development across countries and time. Despite these criticisms, the WGI have withstood the test of time.

Index of Economic Freedom (IEF): The Index of Economic Freedom (IEF) is a major effort by the Heritage Foundation and the Wall Street Journal with aims at measuring institutional development around the world; the latest version of this index is presented in Miller et al. (2014). Similarly to the EFW index, the IEF measures institutional development by focusing on the concept of *economic freedom*. The authors of the index define economic freedom as “the fundamental right of every human to control his or her own labor and property.” In their report, the authors argue that economically free societies are characterized by governments that allow labor, capital and goods to move freely, and that refrain from coercion or constraint of liberty beyond the extent necessary to protect and maintain liberty itself. This, in turn, is argued to allow individuals to be free to work, produce, consume, and invest in any way they please. The index measures ten specific components of economic freedom; scores on these components, which are the

¹⁰These issues are addressed formally in Chapter 5.

result of compiling several sub-variables stemming from various sources, are equally weighted and averaged to produce an overall economic freedom score for each country. First published in 1995 (Johnson et al., 1995), the IEF currently provides yearly data for the period 1995-2014. As of its last edition, the index covers 186 countries around the world.

The academic literature using the Index of Economic Freedom is limited. Even though the IEF was conceived as a result of the same set of meetings as the Economic Freedom of the World index, the support in favor of the EFW over the IEF is emphatic (Berggren, 2003; Doucouliagos, 2005). An example of this preference can be traced back to the fact that several prominent proponents of creating a comprehensive measure of economic freedom around the world, like Milton Friedman, Gary Becker, Armen Alchian and Douglas North, chose to join the EFW project over supporting the IEF efforts. A second example can be derived from a brief comparison between the two latest manuscripts describing the impact of the EFW and the IEF on the empirical literature: Hall and Lawson (2014), and Miller et al. (2014), respectively. While the former objectively presents 198 articles that have used the EFW index as an independent variable in an empirical study, the latter is limited to a few anecdotal references stemming mainly from public policy institutions and private firms. Lastly, there exist a few studies that provide detailed criticisms of the index: De Haan and Sturm (2000) argue that several of the indicators included in the IEF lack a sound theoretical foundation, while Karlsson (2005) criticizes the index for employing incorrect data and for presenting deep methodological flaws.

In light of the low levels of validation received by the Index of Economic Freedom in the academic literature, the IEF will not be considered as its own institutional measure for the empirical analysis conducted in this research. The index, however, will be taken into account to some degree in this study as one of the many components of the WGI dataset.

Freedom in the World Index (FWI): The Freedom in the World Index (FWI) is a major effort of Freedom House with aims at measuring institutional development around the world; the latest version of this index is presented in Puddington (2014). The index claims to assesses the real-world rights and freedoms enjoyed by individuals, rather than governments or government performance *per se*; it assumes that freedom for all peoples is best achieved in liberal democratic societies (Freedom House, 2014). The index is produced by a team of in-house and external analysts and expert advisers from the academic, think tank, and human rights communities (Freedom House, 2014). The countries are scored by relying on news articles, academic analyses, reports from nongovernmental organizations, and individual professional contacts; the scores are based on the conditions and events within each country's borders during the coverage period. First published in 1972 (Gastil, 1972), the FWI currently provides yearly data for the period 1972-2014. As of its last edition, the index covers 195 countries around the world.

The academic literature using the Freedom in the World Index is also limited. There exist two main concerns about employing this dataset as a measure of institutional development: (1) methodological continuity; and (2) ideological bias. In regard to

methodological continuity, for example, Mainwaring et al. (2001) highlight the many FWI changes in scoring criteria. As for ideological biases, studies like Mainwaring et al. (2001) and Przeworski (2003) express concern about the favorable view that the authors of the index hold of democratic institutions and for their stark dismissal of leftists governments. The authors of the Economic Freedom of the World report share these concerns. In Gwartney et al. (1996), the authors argue that the FWI reflect the Freedom House perspective that democratic political procedures and civil liberties are the most important aspects of freedom. “According to this philosophy,” they state, “highly progressive taxation and large income transfers are entirely consistent with individual liberty, if policies in these areas are approved by democratic majorities of legislative bodies.” In their perspective, the FWI approach trivializes and distorts economic freedom by making it dependent on the political process.

In light of the low levels of validation received by the Freedom in the World Index in the academic literature, the FWI will not be considered as a separate institutional measure for the empirical analysis conducted in this research; however, the FWI is one of the several components of the WGI.

THEORY

This research examines the relationship between institutional development and private credit riskiness around the world. The measure used in this study to proxy for private credit riskiness is the national average of nominal private lending rates, provided by the World Bank. To proxy for institutional development, this study considers two distinct institutional datasets: the main results are based on the Economic Freedom of the World (EFW) database, produced by the Fraser Institute (Gwartney et al., 2013); alternative results are estimated using the Worldwide Governance Indicators (WGI), produced by Kaufmann et al. (2011).

According to the World Bank (2002), market-based institutions transmit information efficiently, enforce property rights and contracts, and secure competition, which all affect the incentives to participate in a market. The EFW index is closely related to the so-called Washington consensus De Haan et al. (2006). In other words, a more traditional way of understanding economic freedom is by referring to it as economic *liberalization*. Given that standard economic theory relates liberalization with positive macroeconomic outcomes, it is also expected that the EFW index would be positively related to macroeconomic performance.

Lower private lending rates are generally seen as a positive economic outcome: on one hand, lower lending rates reduce the cost of borrowing by businesses and consumers, which in turn incentivizes investment and subsequent economic growth; on the other, they represent a reduced cost of lending for banks, which increases bank profit margins and the

overall capital availability in an economy. Therefore, on basic theoretical grounds, it is expected that economic freedom should have an inverse relationship with private-sector lending rates; this thesis is designed to test this hypothesis empirically. More explicitly, this paper tests whether institutional development is negatively associated with private lending rates after controlling for other standard macroeconomic variables. A further argument is made on theoretical grounds that private lending rates differentials are explained in part due to private credit riskiness.

This chapter establishes the theoretical framework for the remainder of this study. It is organized into two sections: the first section presents a theoretical argument for the connection between private lending rates and country-level credit riskiness; the second section presents a theoretical argument for the connection between the Economic Freedom of the World (EFW) index and country-level institutional development.

Private Lending Rates and Credit Riskiness

One of the premises of this study is that private lending rates serve as a proxy for country-level credit riskiness. In this section, an argument is made justifying this premise on the grounds of economic theory.

Lending rates are inherently related to probabilities of default, and thereby to credit riskiness: on a first instance, when the expected loss increases, the higher cost of lending drives lending rates up. But in addition, when lending rates increase, this probability of default also increases. In other words, lending rates and credit riskiness are not only positively correlated, but they also reinforce each other.

Furthermore, it is noted that under the assumption of perfect markets, capital would flow freely following the highest returns. This represents no transaction costs in the business of lending money. This being the case, the main cross-country differentiation in lending rates would stem from risk disparities.

The Economic Freedom of the World Index and Institutional Development

The second premise of this study is that the Economic Freedom of the World index captures the level of overall institutional development in a given country. In this section, an argument is made justifying this premise on the grounds of economic theory.

The EFW index is comprised of five areas and 24 components. This index ranks each component on a scale from zero to 10, with 10 being the most desirable outcome, and zero being the least desirable outcome. Each one of the five areas of the EFW index is obtained by a simple average of its components; the overall EFW score is, in turn, obtained from a simple average of the five areas. Below, each one of the areas of the EFW index is examined in further detail, and an explanation based on standard microeconomic theory is given for their inclusion into an index measuring economic freedom.

The first area of the EFW index is size of government; it is comprised of four components. The first two components are government consumption as a share of total consumption, and transfers and subsidies as a share of GDP. The underlying theoretical argument for the inclusion of these components in the EFW index is that if government spending increases relative to spending by individuals, households, and businesses, then personal choice is substituted by government decision-making, which in turn reduces

economic freedom. In other words, when government consumption is a larger share of total consumption, personal choice is substituted by political choice; similarly, when some individuals are taxed in an economy in order to provide transfers to other individuals, the right of the former to keep what they have earned is considered to be violated.

The third component in Area 1 measures the extent to which countries use private (over government) investment and enterprises as the structural framework for the allocation of resources. In theory, the incentive system faced by government enterprises is fundamentally different to the system faced by private firms. On a basic level, for instance, government enterprises are less dependent on consumers and investors for revenue and capital than their private counterparts; moreover, government enterprises often operate under protected markets whereas private firms generally do not. Hence, as government enterprises produce a larger share of total output, it is expected that economic freedom would decrease.

The fourth and last component of Area 1 is based on two sub-components: the top marginal income tax rate and the top marginal income and payroll tax rate. The underlying theoretical argument for the inclusion of this component in the EFW index is that high marginal tax rates that apply at relatively low income levels prevent individuals from keeping a larger share of their earnings and are indicative of higher levels of government dependency. Taken together, the four components of Area 1 measure the degree to which a country defines its institutional framework based on personal choice and free markets rather than on government budgets and political decision-making.

The second area of the EFW index is legal system and property rights. It is

comprised by nine components: judicial independence, impartial courts, protection of property rights, military interference in rule of law and politics, integrity of the legal system, legal enforcement of contracts, regulatory restrictions on the sale of real property, reliability of police, and business costs of crime. These components are justified to be included into an index of economic freedom because the protection of individuals and their property is widely believed to be central to a free civil society (North, 1993). The authors of the EFW index add eloquently:

“Security of property rights, protected by the rule of law, provides the foundation for both economic freedom and the efficient operation of markets. Freedom to exchange, for example, is meaningless if individuals do not have secure rights to property, including the fruits of their labor. When individuals and businesses lack confidence that contracts will be enforced and the fruits of their productive efforts protected, their incentive to engage in productive activity is eroded. Perhaps more than any other area, this area is essential for the efficient allocation of resources. Countries with major deficiencies in this area are unlikely to prosper regardless of their policies in the other four areas.”
Gwartney et al. (2008)

The third area of the EFW index is sound money. It is comprised of four components: money growth, the standard deviation of inflation, inflation from the most recent year, and freedom to own foreign currency bank accounts. The theoretical argument for the inclusion of the first three components into an index of economic freedom is as follows: first, money growth that is disproportionate with growth in real economic output has inflationary effects; second, when inflation rates increase, they tend to become more volatile; and third, high and volatile rates of inflation distort relative prices, alter the fundamental terms of long-term contracts, and make it virtually impossible for individuals and businesses to plan sensibly for the future (Gwartney et al.,

2013). In other words, when government spending is financed by an indiscriminate increase in the money supply by central banks, in effect the government is expropriating the property of its citizens and thereby violating their economic freedom. The last component of this area, freedom to own foreign currency bank accounts, is included in order to account for the potential access that individuals and firms may have to sound money via international markets; that is, if bankers can offer saving and checking accounts in other currencies or if citizens can open foreign bank accounts, then access to sound money is expected to increase as well as economic freedom.

The fourth area of the EFW index is freedom to trade internationally. It is comprised of four components: tariffs, regulatory trade barriers, black-market exchange rates, and controls on the movement of capital and people. The main underlying argument for the inclusion of these components into an index of economic freedom is that trade restrictions such as tariffs and quotas hinder voluntary exchange, which is considered to be a mutually beneficial interaction in standard economics. In addition, phenomena such as high black-market premium rates indicate a high degree of exchange rate controls, which restrict the free flow of currencies and further stifle trade. Lastly, bureaucratic inefficiencies and rent-seeking officials generate overly burdensome and time consuming transactions costs, which increase the overall costs of trade and thereby reduce trading volumes.

The fifth and last area of the EFW index is regulation; it is comprised of three components. The first component measures conditions in the domestic credit market. Under standard economic theory, countries that use the private banking system to allocate

credit and refrain from controlling interest rates foster higher levels of economic freedom. The second component of this area measures labor market regulations. Under standard economic theory, several types of labor-market regulations are seen as infringements on the economic freedom of employers and employees. Among the most prominent labor regulations seen as infringing on individual freedoms are minimum wages, and some aspects of union contracts. The third component is business regulation. It measures the extent to which regulations and bureaucratic procedures create barriers to entry and reduce competition. Under standard economic theory, when regulations restrict entry into markets they are in effect interfering with the freedom to engage in mutually beneficial exchanges, which represents a reduction in economic freedom.

In general, the inclusion of each variable of the EFW index into a measure of economic freedom is in line with standard economic theory. However, a real concern remains to be addressed on the grounds of economic theory: Is it appropriate to bundle economic freedom into one overall index when the components of such an index comprise a wide variety of institutional measures? The answer is ideally not. However, the individual components of such an index are so intricately correlated with each other that any basic attempt to disaggregate them causes methodological issues of multicollinearity or omitted variable bias.¹¹ The empirical literature agrees with this conclusion. Theoretically, one of the authors of the EFW index argues in Lawson (2006) that economic freedom is a bundle that is difficult to disaggregate either statistically or conceptually; in reality, he argues, all of the economic freedom components work

¹¹These issues are further addressed in Chapter 5.

together. The bottom line is, Lawson (2006) argues (and the author of this paper agrees), that the current measures of economic freedom are too crude, and our econometric methods too imperfect to satisfactorily address this issue.

This study makes an attempt to disaggregate the institutional indexes for use in the empirical analysis presented in this paper. However, the results of this procedure create methodological issues in line with the existing empirical and economic theory. These issues are further explored from an econometric perspective in Chapter 5; the following paragraphs explore these issues further from a theoretical perspective.

Consider for instance the second area of the EFW index: legal system and property rights. This area is expected to cause a clear and direct effect on private lending rates; that is, the stronger the legal system and the higher the level of property rights protection in a country, the lower the lending rates are expected to be. A strong legal system, and property rights that are well-established and well-enforced are expected to have a negative impact on lending rates by reducing the cost of lending through at least two channels: first, it serves as a deterrent for borrowers to default, which reduces moral hazard; and second, in the case of an eventual default, it makes the expected value of the recovery for the loan higher.

For the first channel, a high ranking in the legal systems and property rights area indicates that the cost of default for borrowers is high. This results in borrowers having a higher incentive to pay back their loans, as well as in narrowing the pool of borrowers to those who think that their likelihood of being able to repay is high. In both of these cases, the probability of a loss is decreased for the lending firm. Given that expected losses enter

into the cost equation for lending firms, it can be concluded for this case that a higher ranking in the legal systems and property rights area represents a lower cost for lending firms. At lower costs, the industry supply curve is expected to shift downward, thereby driving lending rates down.

A similar argument can be made for the second channel. In the eventuality of a default, a strong legal system and property rights that are well-established and well-enforced facilitate the recovery of a portion of the default and increase the expected magnitude of this portion; that is, it increases both the probability of recovering a loss as well as the proportion of the loss that can be recovered. In effect, then, a higher ranking in the legal systems and property rights area represents a higher expected value of the recovery of a loss. A greater expected value of recovery represents a lower expected value of losses, which drives lending rates down, as explained above.

Consider now an area like size of government. Initially, economic theory might predict that, as a whole, more economic freedom in this area would be associated with lower levels of private lending rates as it might reduce transaction costs and increase the efficiency of resource allocation. However, another argument could be made on the basis of economic theory that smaller governments result in the growth of private investment, which in turn increases demand for loans to private sector thereby driving up lending rates.

It can be seen then that the economic argument for the relationship between private lending rates for some of the areas of the EFW index is not as clear-cut as it might be for others. Moreover, it becomes evident that some areas of economic freedom may affect private lending rates in one direction, while others may affect them in the opposite

direction. In the case of government size, for instance, it is clear that there is a stark difference between a small government due to a failing state, and a small government due to sound economic policies. Some of these issues may then be circumvented by the introduction of interaction variables into the econometric model. Another solution (though a partial one) is to understand that economic freedom works as a whole, and that though some particular components may act in opposing ways, overall all of the components work with each other in enhancing the overall level of economic freedom within a nation.

Though the present study examines some of the interactions proposed above, the main results of this study follow the standard of the literature in employing the aggregate measure of the institutional indexes only.

DATA

In an effort to develop a comprehensive analysis of the cross-country determinants of private lending rates, this study incorporates both economic and institutional variables into its analysis. The first two sections of this chapter, then, are devoted to identifying the set of economic and institutional variables used in this research. A third section explains the standardization procedure applied to all variables used in this study for the sake of comparability. Lastly, a fourth section is included in which the data is summarized and examined in various ways in order to enhance their assimilation.

Economic Variables

This section identifies the economic variables used in this study. These variables are chosen based on the contextual background presented in Chapter 2 and the theoretical framework presented in Chapter 3; the sources used represent the standard in the literature.

The dependent variable for this research is the private lending interest rate (*intrate*), obtained from the International Financial Statistics database compiled by the International Monetary Fund (IMF). This variable is defined as the average national bank rate that usually meets the short-term and medium-term financing needs of the private sector. The units for this variable are percentage points; that is, an *intrate* value of 7.8 represents a private lending interest rate level of 7.8%.

A set of economic controls is also included in the model in order to account for the macroeconomic environment at the country level: *GDP1000*, *infGDPD*, *linf*, *infdiff*, and *linfdiff*. Each of these economic controls were obtained from or constructed based on the

World Development Indicators (WDI) database compiled by the World Bank, and they are defined as in the below.

The variable *GDP1000* represents the national gross domestic product in thousands of constant 2005 U.S. dollars, divided by midyear population. Consistent with the literature, this variable is included as a proxy for general economic development. The units of this indicator are set to thousands of dollars; this is done in an effort to maintain all variables in relatively similar scales so as to avoid computational difficulties.¹²

The variable *infGDPD* represents inflation, as measured by the annual growth rate of the GDP implicit deflator; this indicator is also presented in percentage points. This variable is the most standard control used in the literature, as economic theory predicts an unambiguous positive relationship between lending rates and inflation (Patterson and Lygnerud, 1999). Additionally, inflation is relevant as a measure of macroeconomic instability; Boyd et al. (2001), for instance, argue that countries with high inflation have underdeveloped financial systems and banks. Lastly, inflation has been shown to exacerbate informational asymmetries (Huybens and Smith, 1999).

The variable *infdiff* is calculated by subtracting the US inflation rate from *infGDPD*. This is done in order separate the country-level inflationary effects from the international macroeconomic environment. The international macroeconomic environment is then captured by the *US10nir* variable, which represents the annual nominal interest rate of 10-year U.S. Treasury bank notes, given in percentage points. Data for the *US10nir* indicator is obtained from the U.S. treasury department.

¹²These computational difficulties refer to the invertibility of the matrix $X'X$. See Greene (2003) for further details.

Lastly, the variables *linf* and *linfdiff* represent the one-year lag values of *infGDPD* and *infdiff*, respectively. These controls are included in order to account for the fact that lending rates, depending on the loan term, may reflect the inflationary environment of the previous period.

Institutional Variables

This section identifies the institutional variables used in this study. These variables are chosen based on the contextual background presented in Chapter 2 and the theoretical framework presented in Chapter 3. In the context of this study, an institutional variable is defined as any indicator that captures some aspect of the set of rules, enforcement characteristics of rules, and norms of behavior that govern the structural foundation of repeated human interactions (North, 1990).

Two distinct sets of institutional variables are considered in this study: The main results are based on the Economic Freedom of the World (EFW) database, produced by the Fraser Institute (Gwartney et al., 2013); alternative results are estimated using the Worldwide Governance Indicators (WGI), produced by Kaufmann et al. (2011). The following two subsections provide a basic introduction of these two datasets; for a more detailed review, please refer to Chapter 2.

Economic Freedom of the World (EFW) Data

The EFW dataset consists of twenty-four indicators called ‘components’, which measure the degree to which the policies and institutions of a country support *economic*

freedom. According to Gwartney et al. (2013), a country is said to enjoy a high degree of economic freedom when it exhibits a high degree of institutional development in areas of personal choice, voluntary exchange, freedom to compete, and security of privately owned property.

The twenty-four components of this dataset are aggregated into five areas: size of government (*govsize*), legal system and property rights (*lnprights*), sound money (*sndmny*), freedom to trade internationally (*freetr*), and regulation (*clbreg*). Each one of these five areas is the result of a simple average of its components. Subsequently, an overall summary EFW index variable (*EFW*) is constructed from a simple average of the five areas.

The components, the areas, and the overall summary index of this dataset are all structured on a scale from zero to 10, with 10 being the most desirable outcome in standard economics and zero being the least desirable outcome. The data span 153 countries and cover the period of 1970-2000 every five years, and of 2000-2011 yearly.

Worldwide Governance Indicators (WGI) Data

The WGI dataset is composed of six indicators: voice and accountability, political stability and absence of violence/terrorism, government effectiveness, regulatory quality, rule of law, and control of corruption. These data span 215 countries and cover the period of 1996-2002 every two years, and of 2002-2012 yearly.

The six indicators in the WGI present a high degree of positive correlation among them, and of subsequent collinearity. After careful consideration, these six indicators are

aggregated by means of a simple average procedure in order to create an overall summary WGI index variable *WGI*.¹³

These data are also structured in a way in which higher scores represent more desirable outcomes, and vice versa. In contrast with the EFW index, however, these data are constructed on a scale that ranges from around -2.5 to around 2.5.

Standardization Procedure

Given the great diversity in ranges and variations exhibited by the variables employed in this research, each variable is standardized to facilitate cross-variable comparisons within any given model specification. The coefficients are estimated with standardized variables so that comparison of the magnitude of the coefficients indicates the relative magnitude of the influence on the dependent variable (Pindyck and Rubinfeld, 1998). The standardized form of each variable is created by subtracting the variable mean and dividing the difference by the standard deviation of the original variable; the resulting standardized indicator is denoted by prefixing a *z* to the original variable name. For example,

$$zEFW = \frac{EFW - \text{mean}(EFW)}{sd(EFW)}, \quad (1)$$

where *mean*(·) and *sd*(·) stand for sample average and sample standard deviation, respectively.

¹³For further details about these considerations, please refer to Chapter 2 and Chapter 5.

Summarizing and Examining the Data

This section presents a few ways to visualize the data used in this study in order to enhance their assimilation: the first level of visualization explores the distribution of the data by means of summary statistics, histograms, and scatter plots; the second level examines the time component of the dataset by means of time-series plots; and the third level examines the cross-country component of the dataset by presenting a few maps of the most relevant variables during the year 2011.¹⁴

Basic Summary and Examination

Table 1 presents summary statistics for each of the main variables in this study.¹⁵ Several important aspects of the data can be identified in this table: (1) the GDP per capita levels present the greatest variability, followed by the private lending rates, and the inflation levels; (2) the scaling differences between the *EFW* and the *WGI* variables is evident, though their standard deviation is quite similar; and (3) with the exception of the *WGI* index and the inflation levels, all variables in the sample are always positive (including, notably, the private lending rates). Additionally, it may be noted that even though some observations present negative inflation levels, these are relatively few as indicated by a positive 10th percentile threshold; moreover, the magnitudes of the few negative inflation levels seem to be within a reasonable range, as indicated by a minimum value of -27.6317.

¹⁴ The sample used to derive these visualizations is the base sample selected for this paper, N1035. An in-depth discussion of the alternative sample specifications can be found in Chapter 5.

¹⁵ Summary statistics for the data used under all alternative sub-samples are presented in Appendix C.

Table 1: Summary Statistics for the Base Sample

Variable	Mean	Std. Dev.	P10	P50	P90	Min	Max
<i>intrate</i>	13.4277	9.4473	5.3100	11.2917	22.8556	0.5000	97.2917
<i>EFW</i>	6.8382	0.8678	5.8000	6.9000	7.9000	3.6000	9.2000
<i>WGI</i>	0.0435	0.8638	-0.9569	-0.1915	1.3950	-1.6699	1.9861
<i>GDP1000</i>	10.0485	14.0164	0.4211	3.6354	34.5214	0.1411	67.8045
<i>infGDPD</i>	7.0963	7.5097	0.6126	5.6164	15.8304	-27.6317	68.4437
<i>US10nir</i>	4.0145	0.6701	3.3900	4.1500	4.7600	2.5200	5.0400

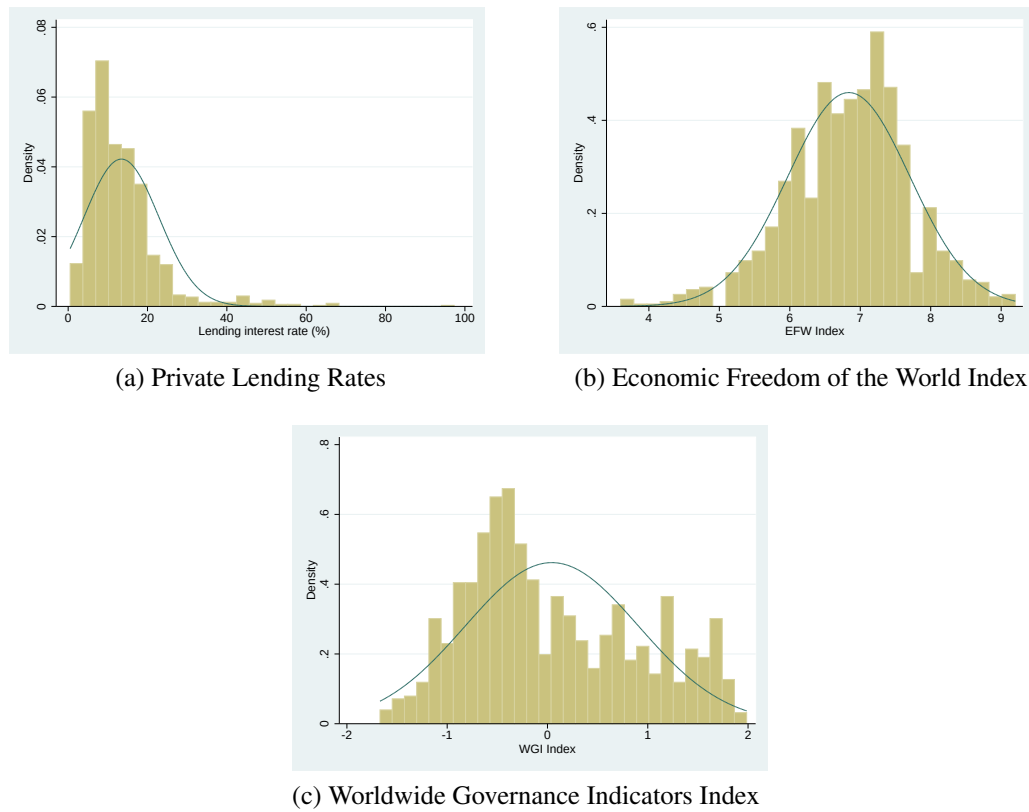
Notes: The variable *intrate* stands for the private lending interest rate. The variable *EFW* stands for the summary Economic Freedom of the World index. The variable *WGI* stands for the summary worldwide governance indicator index. The variable *GDP1000* stands for national gross domestic product in thousands of constant 2005 U.S. dollars, divided by midyear population. The variable *infGDPD* stands for current year inflation. The variable *US10nir* stands for the annual nominal interest rate of 10-year U.S. Treasury bank notes. The statistics reported are in the following order: (1) arithmetic mean; (2) standard deviation; (3) 10th percentile threshold value; (4) 50th percentile threshold value; (5) 90th percentile threshold value; (6) minimum value; and (7) maximum value.

One of the best ways to visualize Table 1 is through the creation of a few histograms. Figure 2 presents an exhibit of three histograms, one for each of the three main variables of interest in this study: Figure 2(a) presents a histogram of the private nominal lending rates, Figure 2(b) presents a histogram of the EFW index, and Figure 2(c) presents a histogram of the WGI index. For the most part, these histograms indicate that the data do not suffer from significant outlier concerns.¹⁶ Furthermore, it can be noted that all three variables exhibit a relatively normal distribution, in which the mean, the median, and the mode are all values relatively close to each other.

Lastly, a preliminary visualization of the relationship between private lending rates and institutional development is provided. Figure 3 presents an exhibit of three scatter plots depicting the pairwise relationships between private lending rates, the Economic Freedom of the World index, and the Worldwide Governance Indicators index; all of these

¹⁶The sensitivity of the results in this study were tested by keeping only the bottom 75th percentile of the data in order to thoroughly rule out any concerns about outliers driving the results; the outcome of these tests suggest no reason to be concerned about the outliers driving the conclusions of this study.

Figure 2: Distribution of the Main Variables



variables are presented in their standardized form. Figure 3(a) presents a scatter plot of the Economic Freedom of the World index against private lending rate levels. The red line represents the fitted estimation yielded by the bivariate regression of the EFW index on private lending rates; the reported slope represents the bivariate correlation level between the two variables. The procedure yields a negative correlation of roughly 46% between the private lending rates and the Economic Freedom of the World index. Though these tools are very basic, given that they do not account for the variation in critical economic controls such as inflation, this visualization provides a preliminary idea of the potential relationship between private lending rates and the EFW index.

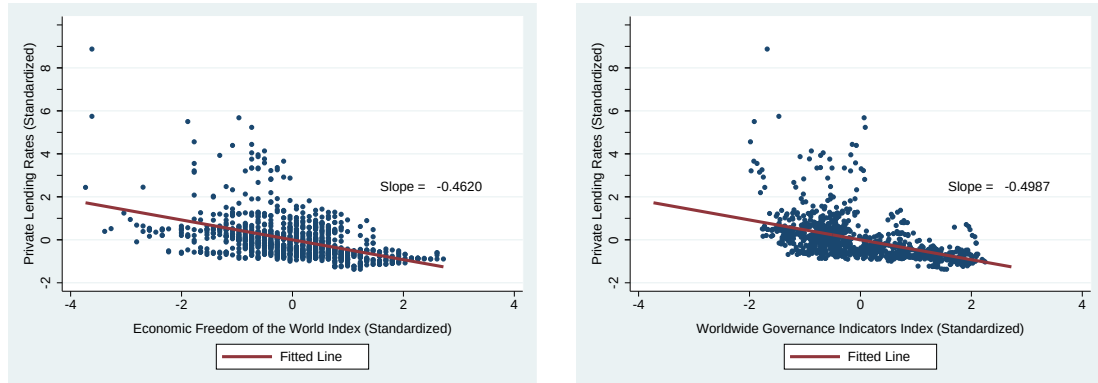
Figure 3(b) presents a scatter plot of the Worldwide Governance Indicators index

against private lending rate levels. The red line represents the fitted estimation yielded by the bivariate regression of the WGI index on private lending rates; the reported slope represents the bivariate correlation level between the two variables. The procedure yields a negative correlation of roughly 50% between the private lending rates and the Worldwide Governance Indicators index. Though these tools are very basic, given that they do not account for the variation in critical economic controls such as inflation, this visualization provides a preliminary idea of the potential relationship between private lending rates and the WGI index. Furthermore, the similarity in the correlation values between the private lending rates and both of the institutional indexes indicate that: (1) both institutional indexes might be capturing the same overall phenomenon (institutional development), which is one of the premises of this study; and (2) the connection between the private lending rates and institutional development might be robust to the institutional measure used.

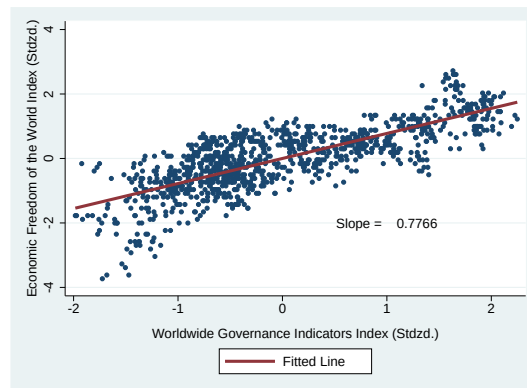
Finally, Figure 3(c) is presented in order to provide a preliminary insight into the relationship between the two institutional indexes used in this study: the Economic Freedom of the World index, and the Worldwide Governance Indicators index. The red line represents the fitted estimation yielded by the bivariate regression of the WGI index on the EFW index; the reported slope represents the bivariate correlation level between the two variables. The procedure yields a positive correlation of roughly 78% between the Economic Freedom of the World index and the Worldwide Governance Indicators index. These preliminary results are consistent with the visualizations of the data presented in Figures 3(a) and 3(b). Moreover, these results are also consistent with the premises of this

study, which are based on the empirical background presented in Chapter 2 and on the theoretical framework defined in Chapter 3.

Figure 3: Correlation Between Private Lending Rates and Institutional Indexes



(a) Private Lending Rates and Economic Freedom of the World Index (b) Private Lending Rates and Worldwide Governance Indicators Index



(c) Institutional Indexes

Data Through Time

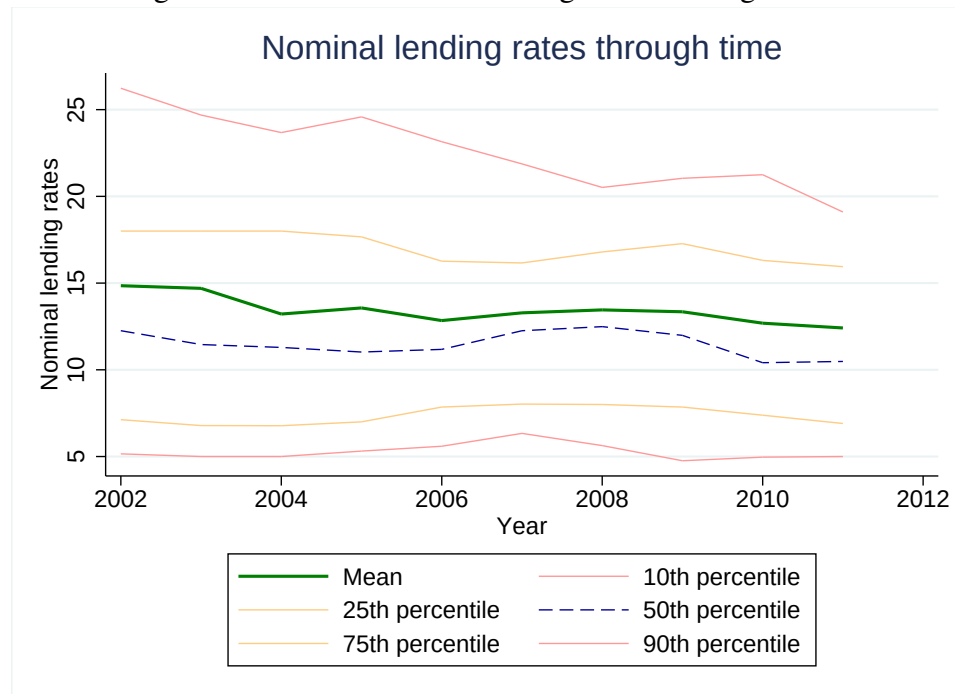
The histograms presented in the previous section provide an overview of the distribution of the data; however, these histograms are obtained by pooling all the datapoints over time into one large set of observations. Pooling all the data into one aggregate dataset has the advantage of increasing the sample size available to be used for

empirical analyses. However, given the nature of this study, failing to account for the temporal dimension of the data could represent a critical loss of information. A visual way of accounting for the temporal nature of the data is to observe how a set of summary statistics for each variable changes over time.

The following four figures focus on conveying the temporal dimension of the data. The time span considered in these figures is 2002-2011, as this is the relevant time span used in the development of the main analysis presented in this thesis.

Figure 4 presents the levels of private nominal lending rates through time. The green line represents the rate obtained by averaging the private lending rates of all of the countries in the sample by year. The blue dotted line represents the median private lending rate across countries by year. The yellow lines mark the inner quartile band bounded by the 25th and 75th percentile levels of private lending rates by year. Lastly, the red lines mark the outer quartile band bounded by the 10th and 90th percentile levels of private lending rates by year. From this figure, the mean interest rates are consistently, though only slightly, higher than the median interest rates throughout the entire time period; this indicates that, though the data is slightly skewed to the right, there are no serious outlier concerns in the temporal component of the data. In addition, the percentile lines illustrate that there is a significant degree of variation in private lending rates across observations within each particular year. Furthermore, the spread between the lowest and the highest lending rates has been consistently decreasing throughout the years; the main temporal change appears to stem precisely from the consistent lowering of private lending rates levels among the top 90th percentile of the data.

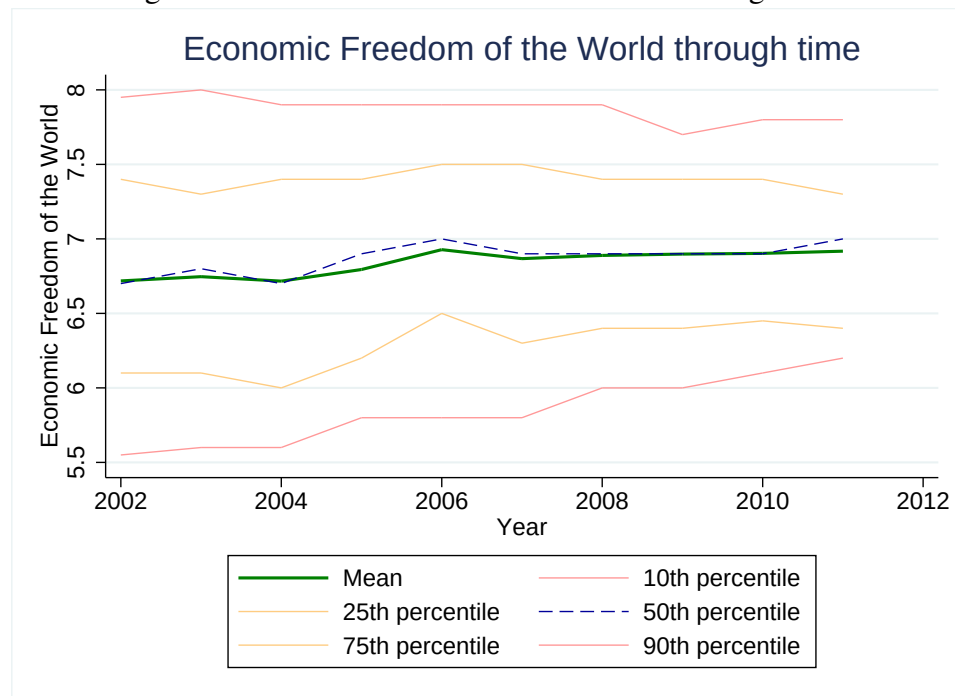
Figure 4: Private Nominal Lending Rates Through Time



In a similar fashion, Figure 5 presents the Economic Freedom of the World index through time. The green line represents the index obtained by averaging the EFW ratings of all of the countries in the sample by year. The blue dotted line represents the median EFW ratings across countries by year. The yellow lines mark the inner quartile band bounded by the 25th and 75th percentile levels of EFW by year. Lastly, the red lines mark the outer quartile band bounded by the 10th and 90th percentile levels of EFW by year. From this figure, the mean and the median of the data are almost identical throughout time; this indicates little skewness in the distribution of the data throughout time. In addition, the percentile lines illustrate that there is a significant degree of variation in the EFW index across observations within each particular year. Furthermore, the spread between the lowest and the highest levels of the EFW index has been consistently

decreasing throughout the years; the main temporal change appears to stem precisely from the consistent increase of the EFW index levels among the bottom 10th percentile of the data. This last observation is of particular interest, as it is an early suggestion of the possible negative association between private lending rates and the EFW index levels.

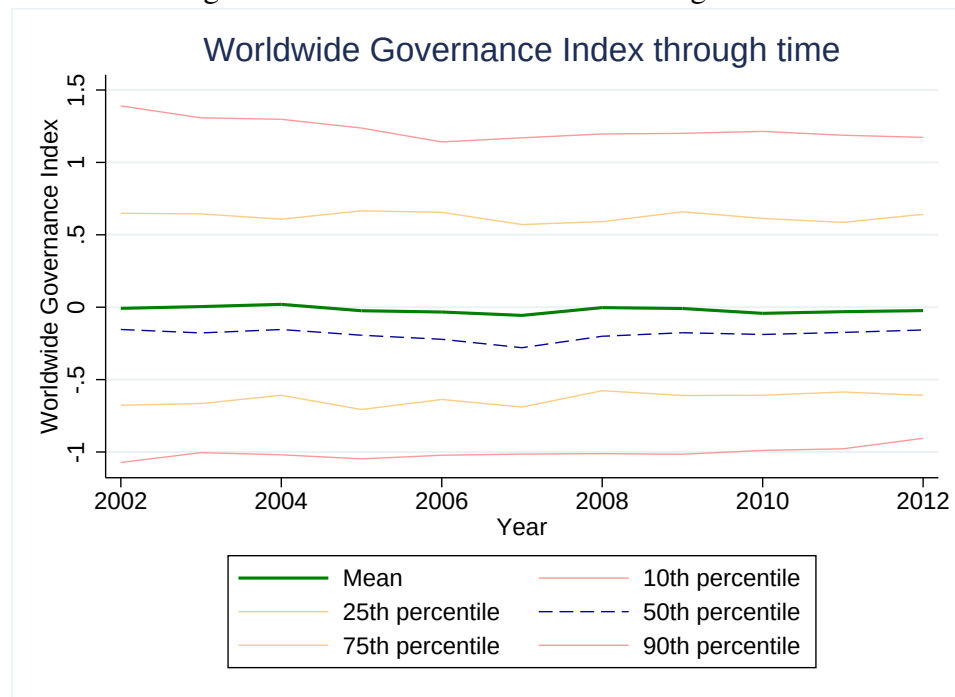
Figure 5: Economic Freedom of the World Through Time



Finally, Figure 6 presents the Worldwide Governance Indicators index through time. The green line represents the index obtained by averaging the WGI ratings of all of the countries in the sample by year. The blue dotted line represents the median WGI ratings across countries by year. The yellow lines mark the inner quartile band bounded by the 25th and 75th percentile levels of WGI by year. Lastly, the red lines mark the outer quartile band bounded by the 10th and 90th percentile levels of WGI by year. From this figure, the mean interest rates are consistently, though only slightly, higher than the

median interest rates throughout the entire time period; this indicates that, though the data is slightly skewed to the right, there are no serious outlier concerns in the temporal component of the data. In addition, the percentile lines illustrate that there is a significant degree of variation in the WGI index across observations within each particular year. Lastly, the spread between the lowest and the highest levels of the WGI index has been slightly decreasing throughout the years; this can be interpreted as an early suggestion of the possible negative association between private lending rates and the WGI index levels.

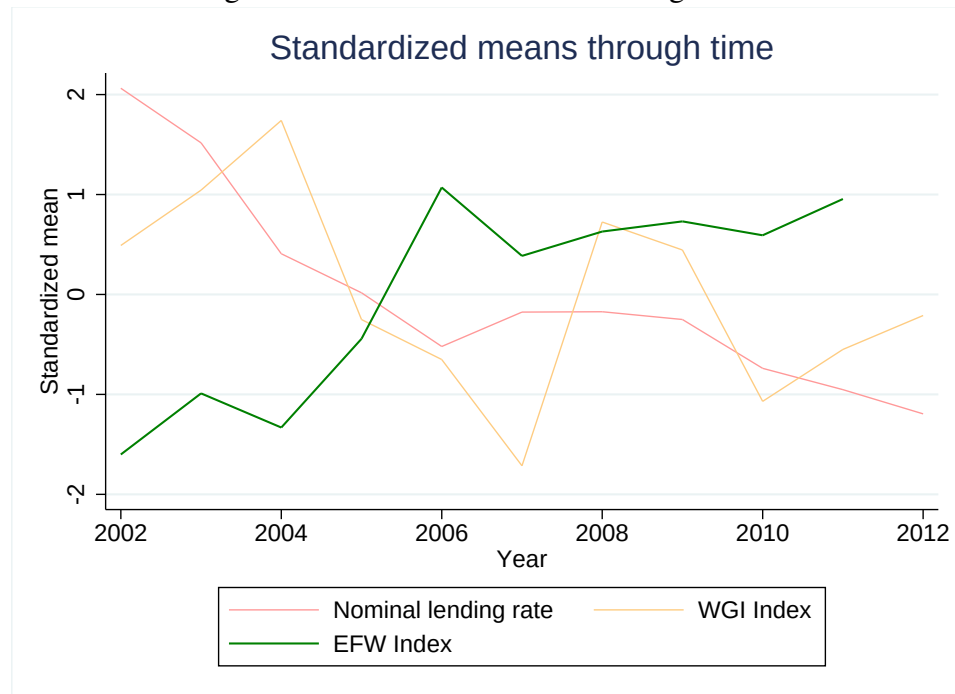
Figure 6: Worldwide Governance Through Time



Yet another way of summarizing the data through time is presented in Figures 7 and 8. Figure 7 presents the standardized means of the three main variables of interest in this study as a function of time. This figure seeks to provide a preliminary understanding of the relationship among each of the three main variables of interest as a function of time.

The standardization of the variables allows for a more clear comparison of their relative changes through time. Note, for example, that a one-unit change in private lending interest rates is not as economically significant as a one-unit change in the WGI index, given the scaling and the distributional differences between these two variables; this figure standardizes those changes such that a one-unit change is comparable across all variables. The main conclusions yielded by this figure are: (1) the magnitude of temporal variation across the three variables is comparable in standard units; (2) the levels of EFW index have shown a clear increasing tendency throughout the time sample, whereas the levels of private lending rates have shown a clear decreasing tendency; (3) the WGI index has varied both positively and negatively throughout the years, but does not show a substantial overall change from the beginning to the end of the period; and (4) in general, the levels of EFW index and WGI index tend to increase and decrease at the same time, whereas the levels of private lending rates generally oppose the tendencies of these two institutional indexes.

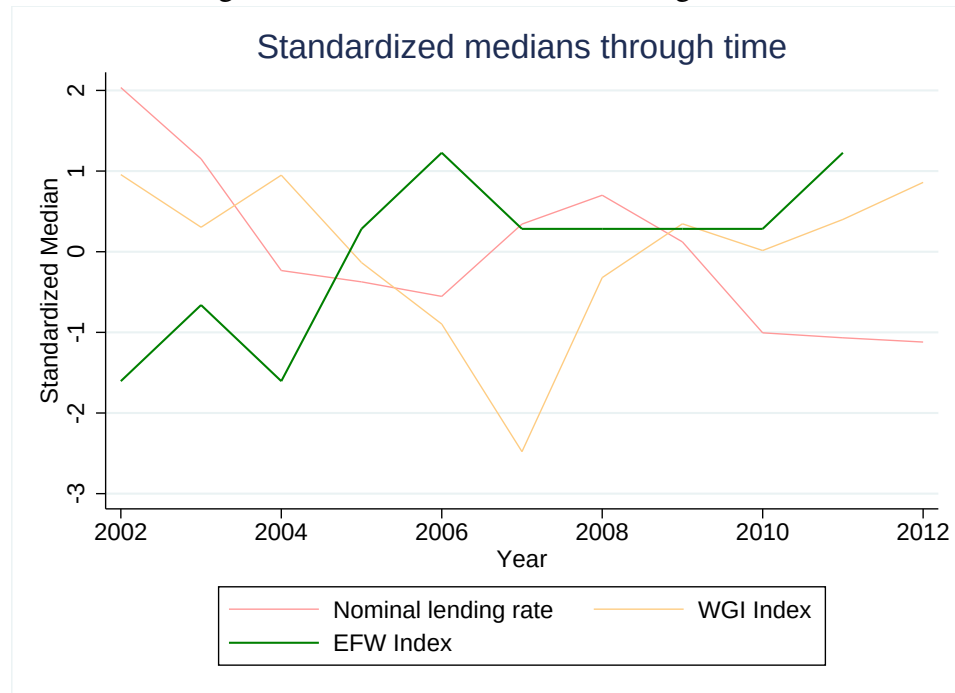
Figure 7: Standardized Means Through Time



As a check on the robustness of the analysis illustrated in Figure 7, Figure 8 presents the standardized medians of the three main variables of interest in this study as a function of time. The results yielded by this figure are qualitatively similar to those of Figure 7, thus providing some evidence of the robustness of this preliminary analysis: (1) the magnitude of temporal variation across the three variables is comparable in standard units; (2) the levels of EFW index have shown a clear increasing tendency throughout the time sample, whereas the levels of private lending rates have shown a clear decreasing tendency; (3) the WGI index has varied both positively and negatively throughout the years, but does not show a substantial overall change from the beginning to the end of the period; and (4) in general, the levels of EFW index and WGI index tend to increase and decrease at the same time, whereas the levels of private lending rates generally oppose the

tendencies of the two institutional indexes.

Figure 8: Standardized Median Through Time



Data Across Countries

The figures presented in the previous subsection acknowledge and capture the time dimension of the data used in this study. However, there is a second dimension of the data that remains to be captured, namely their cross-sectional dimension. The figures presented in this subsection, then, focus on capturing the cross-sectional aspect of the data: Figure 9 presents a map of the private nominal lending rates in 2011; Figure 10 presents a map of the Economic Freedom of the World index in 2011; Figure 11 presents a map of the Worldwide Governance index in 2011; and Figure 12 presents a map for each one of the five areas of the EFW index in 2011.¹⁷

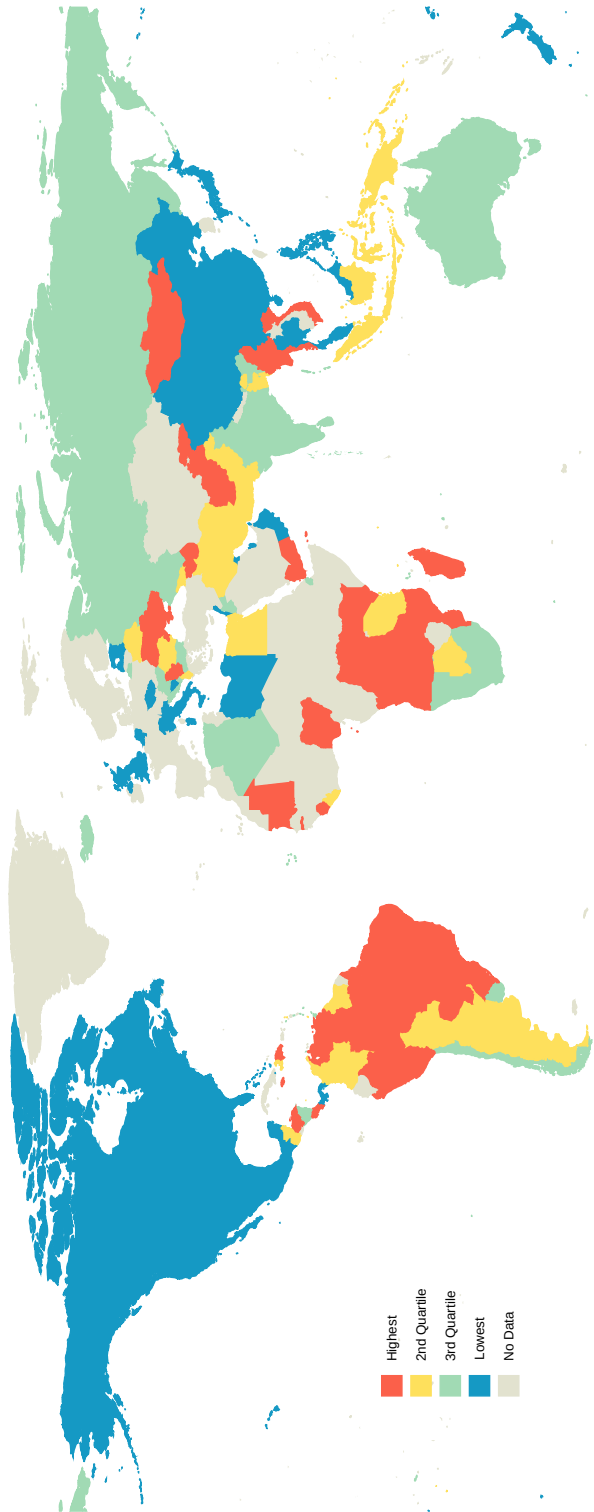
¹⁷The data used in this subsection comes from the raw dataset, in order to maximize the number of countries represented in the maps. A list of countries used in each one of the most distinctive samples considered in

Figure 9 presents a snapshot of the country-level private lending rates for the year 2011. The data are presented by quartiles, and the gray areas represent the countries for which data was not available during the year 2011: the nations presented in blue correspond to those in the lowest quartile of private lending rates; the nations presented in green correspond to those in the third (second lowest) quartile of private lending rates; the nations presented in yellow correspond to those in the second (second highest) quartile of private lending rates; and the nations presented in red correspond to those in the highest quartile of private lending rates. In other words, the countries presented in colors blue and green correspond to those whose private lending rates were lower than the median in the year 2011, while the countries presented in colors yellow and red correspond to those whose private lending rates were higher than the median in the year 2011. From this figure, areas like North America, Western Europe, Japan, Australia and New Zealand all have private lending rates below the median; while areas like Latin America, Eastern Europe, Africa and the Middle East tend to have private lending rates that are above the world median. Additionally, this figure illustrates the lack of availability of data for several countries in Western Europe for the year 2011. Data exists for all Western European nations before the early twenty-first century, which indicates that the lack of availability of data on lending rates for later years stems from the emergence of the Eurozone in 1999; presumably, this caused private lending rate data for most Eurozone members to become unreliable by IMF standards, with the exceptions of the Netherlands and Italy.

Similarly, Figure 10 presents a snapshot of the country-level EFW ratings for the

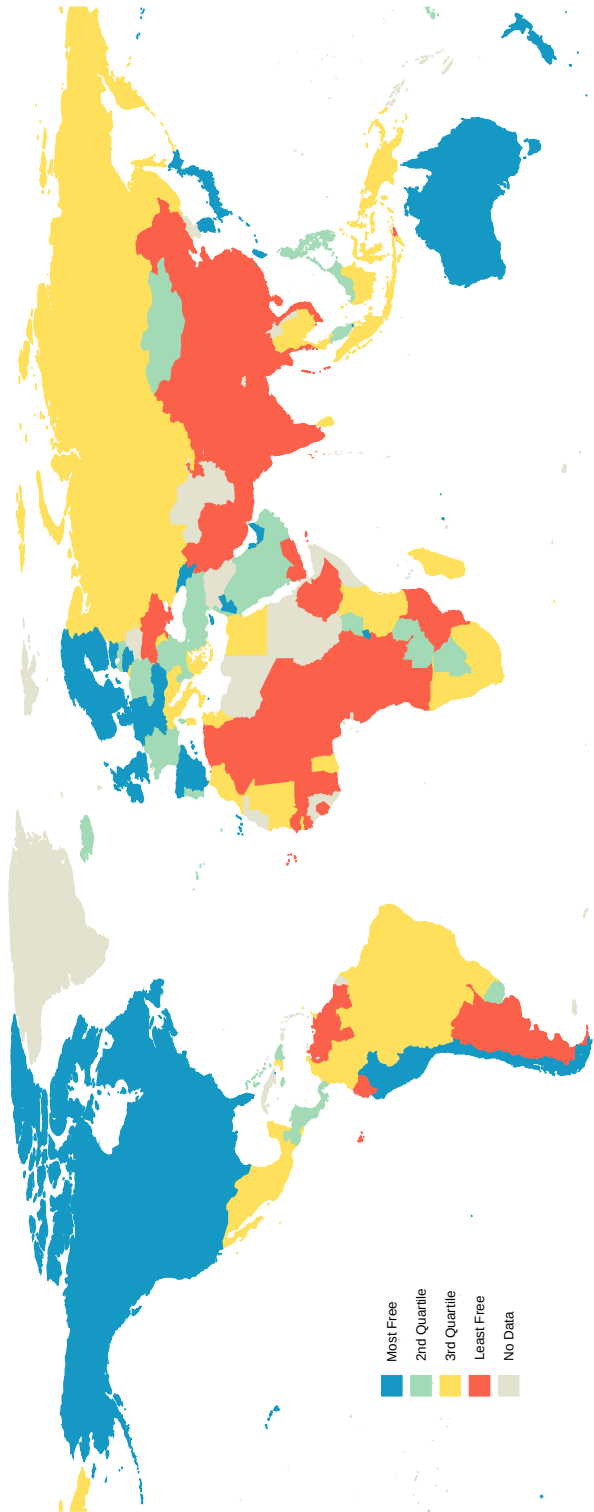
this study is presented in Appendix C; analogous figures to the ones examined in this subsection using the data from the base sample are presented in the same appendix.

Figure 9: Private Lending Rates in 2011



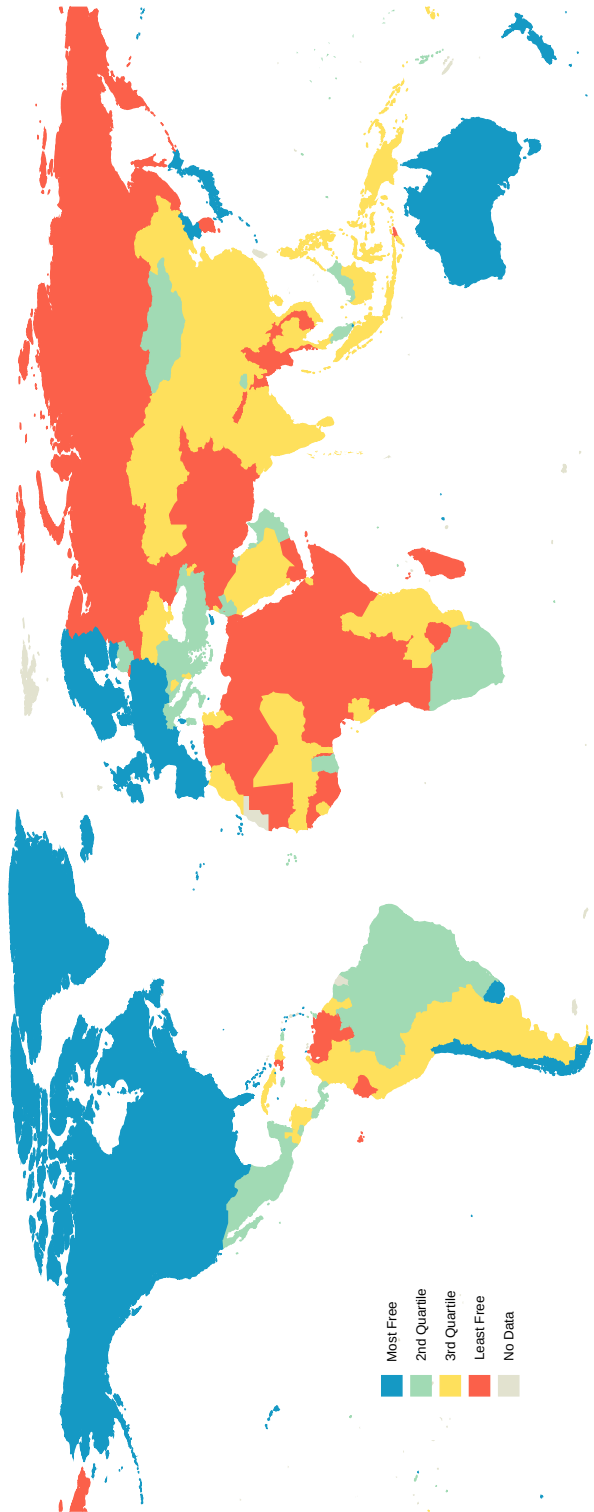
year 2011. The data are presented by quartiles, and the gray areas represent the countries for which data was not available during the year 2011: the nations presented in blue correspond to those in the highest quartile of the EFW ratings; the nations presented in green correspond to those in the second (second highest) quartile of the EFW ratings; the nations presented in yellow correspond to those in the third (second lowest) quartile of the EFW ratings; and the nations presented in red correspond to those in the lowest quartile of the EFW ratings. In other words, the countries presented in colors blue and green correspond to those whose overall EFW ratings were higher than the median in the year 2011, while the countries presented in colors yellow and red correspond to those whose overall EFW ratings were lower than the median in the year 2011. On a first level, this figure illustrates the comprehensive nature of the EFW index, which provides data for the overwhelming majority of the world. Additionally, this figure illustrates how areas like North America, Western Europe, Japan, Australia and New Zealand receive EFW ratings above the median, while areas like Latin America, Eastern Europe, Africa and the Middle East tend to receive ratings that are below the world median. This last point provides a preliminary empirical argument for a potential inverse relationship existing between the EFW index and private lending rates, from a cross-sectional standpoint. It can also be noted, however, that two major countries such as China and India do not seem to fit this argument. This seems to indicate that, even though an inverse relationship appears to exist between the EFW index and private lending rates, there may exist some additional country-specific characteristics yet unaccounted for that have a significant effect in determining this relationship.

Figure 10: Economic Freedom of the World in 2011
 Economic Freedom of the World
 Year 2011



Finally, Figure 11 presents a snapshot of the country-level WGI ratings for the year 2011. The data are presented by quartiles, and the gray areas represent the countries for which data was not available during the year 2011: the nations presented in blue correspond to those in the highest quartile of the WGI ratings; the nations presented in green correspond to those in the second (second highest) quartile of the WGI ratings; the nations presented in yellow correspond to those in the third (second lowest) quartile of the WGI ratings; and the nations presented in red correspond to those in the lowest quartile of the WGI ratings. In other words, the countries presented in colors blue and green correspond to those whose overall WGI ratings were higher than the median in the year 2011, while the countries presented in colors yellow and red correspond to those whose overall WGI ratings were lower than the median in the year 2011. On a first level, this figure illustrates the comprehensive nature of the WGI index, which provides data for virtually all countries in the world. Additionally, this figure illustrates how areas like North America, Western Europe, Japan, Australia and New Zealand receive WGI ratings above the median, while areas like Latin America, Eastern Europe, and Africa tend to receive ratings that are below the world median. This last point provides a preliminary empirical argument for a potential inverse relationship existing between the WGI index and private lending rates, from a cross-sectional standpoint. Here too, however, two major countries such as China and India do not seem to fit this argument. This seems to indicate that, even though an inverse relationship appears to exist between the WGI index and private lending rates, there may exist some additional country-specific characteristics yet unaccounted for that have a significant effect in determining this relationship.

Figure 11: Worldwide Governance in 2011
Worldwide Governance Index
Year 2011



Lastly, Figure 12 presents a snapshot of the country-level ratings of each of the five areas of the EFW index for the year 2011. Here too the data are presented by quartiles, and the gray areas represent the countries for which data was not available during the year 2011: the nations presented in blue correspond to those in the highest quartile of the corresponding EFW area rating; the nations presented in green correspond to those in the second (second highest) quartile of the corresponding EFW area rating; the nations presented in yellow correspond to those in the third (second lowest) quartile of the corresponding EFW area rating; and the nations presented in red correspond to those in the lowest quartile of the corresponding EFW area rating. In other words, the countries presented in colors blue and green correspond to those whose corresponding EFW area rating was higher than the median for the year 2011; while the countries presented in colors yellow and red correspond to those whose corresponding EFW area rating was lower than the median for the year 2011. The figure yields two main conclusions. The first conclusion is that most of the countries receiving high ratings in a particular area of the EFW index also receive high ratings in the other four areas of the index, and vice versa. This conclusion is a data-driven allusion to the claims presented in Chapter 2 (from a literature perspective) and Chapter 3 (from a theoretical framework perspective) regarding the high degree of inter-correlation exhibited by the five areas of the EFW index —overall, regions like North America, Western Europe, Japan, Australia and New Zealand receive EFW area ratings above the median, while regions like Latin America, Eastern Europe, Africa and the Middle East tend to receive EFW area ratings that are below the world median. The second conclusion is that, although the five areas of the EFW index appear to

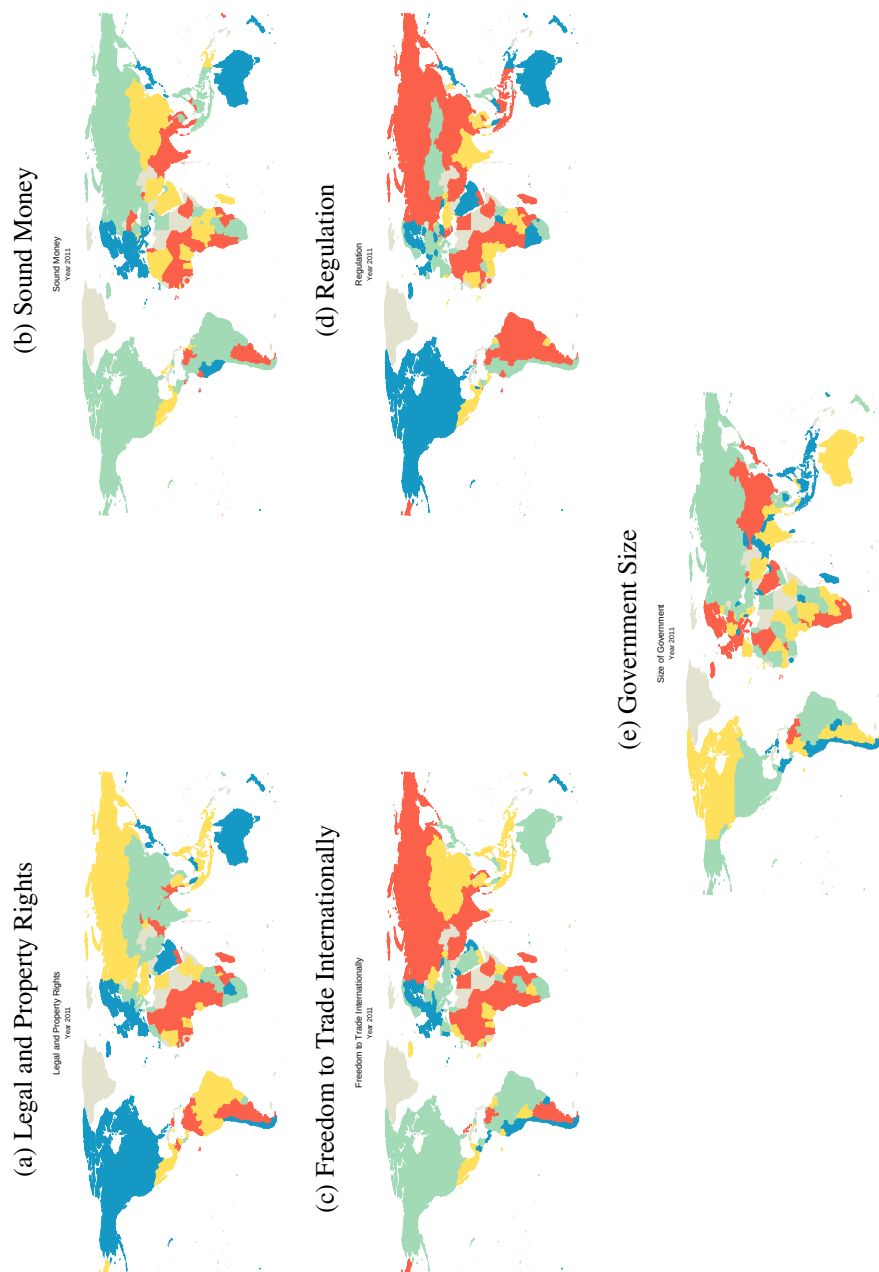
be highly correlated, this correlation is clearly not perfect. This conclusion is a data-driven allusion to the claim presented in Chapter 2 and Chapter 3 that the five different areas of the EFW index are indeed measuring five distinct elements of economic freedom. These results will be further explored from an empirical standpoint in Chapter 5.

Multideimensional Visualization

The previous two subsections focus on presenting a generalized view of the data along one particular dimension. Visualizing the data along a single dimension has the advantage of capturing the entire dataset into a single summary statistic, which can contain a large amount of information. However, this information is generally so densely packed that it can be difficult to identify with certainty the particular components that are driving the levels of said summary statistic. In order to address this issue, this subsection presents three ways of examining the dataset through a multidimensional approach; the trade-off for gaining dimensionality, however, is the reduction in the number of observations available for each visualization.

Earlier in this section, Figure 7 and Figure 8 presented graphs in which all cross-sectional observations were collapsed into one single summary statistic (the mean or the median, respectively) per year. While collapsing cross-sectional observations into a single summary statistic per year allows for the visualization of the entire dataset as a function of time, the resulting plots lose all account of the cross-sectional dimension of the data. In order to partially alleviate this insufficiency, Figure 13 depicts the temporal dimension of the data *within* a small set of countries. This approach allows for a direct

Figure 12: Economic Freedom of the World Areas in 2011



visualization of the interaction between the degree of institutional development and private lending rates: the plots suggest a clear negative relationship between the private lending rate levels (red lines) and the Economic Freedom of the World index levels (green lines) within each country.¹⁸ The variables used in these plots are standardized in order to enhance variation comparability across variables.

Figure 13: Case Studies



Another way of accomplishing a multidimensional visualization of the data is as presented in Figure 14. The panel on the left depicts the average private lending rates for each quartile of the EFW index; the panel on the right depicts the average private lending rates for each quartile of the WGI index. The quartiles are illustrated in colors consistent

¹⁸The countries presented in this Figure were determined by selecting nations with enough variability across time to clearly illustrate the general tendency presented by all the countries in the sample.

with the conventions established in Figures 9-11. It is concluded that, on average: (1) the highest quartiles of both indexes (blue lines) consistently have the lowest private lending rates throughout the time sample; (2) the second highest quartiles of both indexes (green lines) consistently have the second lowest private lending rates throughout the time sample; (3) the second lowest quartiles of both indexes (yellow lines) consistently have the second highest private lending rates throughout the time sample; and (4) the lowest quartiles of both indexes (red lines) consistently display the highest private lending rates throughout the time sample. Furthermore, the relationship between the quartiles of each institutional index and the levels of private lending rates are similar in standard magnitudes. These graphical results add to the preliminary empirical evidence in favor of the hypothesized relationships among the three main variables of interest in this study. More specifically, the plots suggest that: (1) the Economic Freedom of the World index is inversely related to private lending rates; (2) the Worldwide Governance Indicators index is inversely related to private lending rates; and (3) the Economic Freedom of the World index and the Worldwide Governance Indicators index are positively correlated.

Figure 14: Index Quartiles and Private Lending Rates



The last approach presented in this subsection for capturing both the time and cross-country dimensionality of the data is presented in Figure 15. This figure contains three maps, one for each of the three main variables of interest in this study: Figure 15(a) presents the ten-year average of the Economic Freedom of the World index across the world; Figure 15(b) presents the ten-year average of private lending rates across the world; and Figure 15(c) presents the ten-year average of the Worldwide Governance Indicators index across the world. The first step in accomplishing this visualization is creating a balanced dataset in order to prevent a few years from driving the averages in countries where several years of data are missing. Balancing the data causes the number of countries in the sample to decrease to 73; however, each one of the countries included in the resulting dataset is guaranteed to have data throughout the entire period 2002-2011,

for each of the three main variables of interest in this study.

Earlier in this section, Figure 10 presented a map of the Economic Freedom of the World index across the world for the year 2011. Though this figure is important because it depicts the most recent snapshot of the EFW index around the world, it condenses the data on institutional development into a single cross-section for the year 2011. Thus, presenting only a snapshot of the EFW index levels around the world at any single point in time has the potential shortcoming of providing a biased understanding of the data if the EFW levels depicted differ widely from those in the rest of the time period. In order to address this shortcoming, Figure 15(a) presents the ten-year average of the EFW index across the world for the years 2002-2011; averaging the EFW index over the entire 2002-2011 time span makes this map less likely to depict EFW scores that are heavily driven by any one particular year. The maps presented in Figure 10 and Figure 15(a) are very consistent with each other, with a few exceptions like Russia, and a few Latin American countries, whose EFW index scores were higher in 2011 than they were on average throughout the entire 2002-2011 time period, and India, whose EFW index score for 2011 was below its 2002-2011 average level. From this figure, no severe anomalies are apparent in the dataset, which provides confidence in the empirical methods and the results presented in the next two chapters.

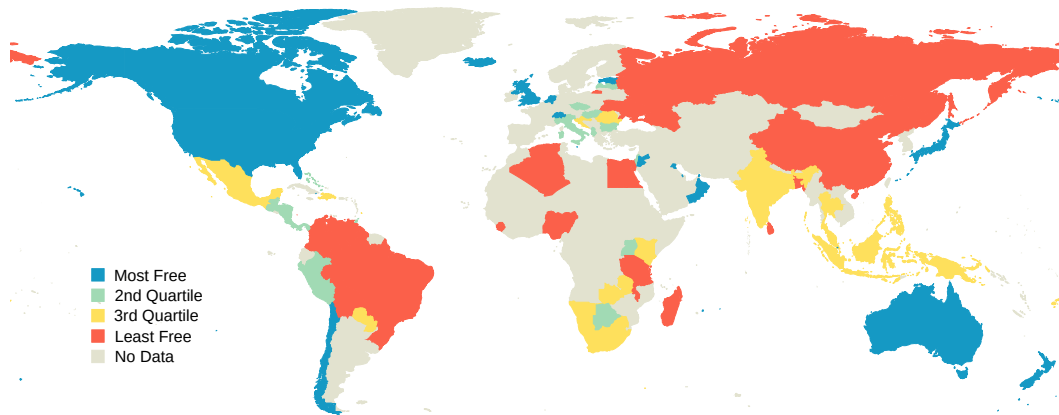
Similarly, Figure 9 presented a map of the private lending rate levels across the world for the year 2011. Though this figure is also important because it depicts the most recent snapshot of the private lending rate levels around the world, it condenses the data on private lending rates into a single cross-section for the year 2011. Hence, presenting only

a snapshot of the private lending rate levels around the world at any single point in time has the potential shortcoming of providing a biased understanding of the data if the private lending rate levels depicted differ widely from those in the rest of the time period. In order to address this shortcoming, Figure 15(b) presents the ten-year average of the private lending rate levels across the world for the years 2002-2011; averaging the private lending rate levels over the entire 2002-2011 time span makes this map less likely to depict private lending rate scores that are heavily driven by any one particular year. The maps presented in Figure 9 and Figure 15(b) are very consistent with each other, with a few exceptions like Russia, New Zealand, Oman, and South Africa, whose private lending rate levels were higher in 2011 than they were on average throughout the entire 2002-2011 time period. Again, from this figure, no severe anomalies are apparent in the dataset, which provides confidence in the empirical methods and the results presented in the next two chapters.

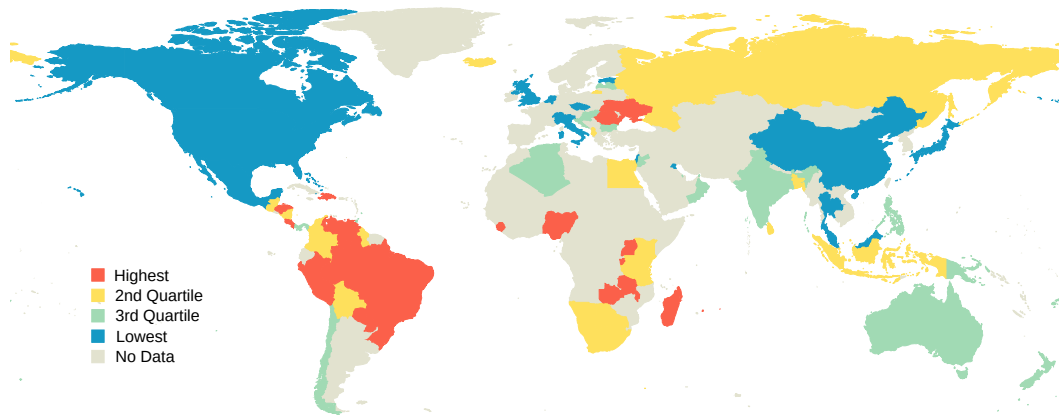
In similar fashion, Figure 11 presented a map of the Worldwide Governance Indicators index across the world for the year 2011. Though this figure is important because it depicts the most recent snapshot of the WGI index around the world, it condenses the data on institutional development into a single cross-section for the year 2011. Thus, presenting only a snapshot of the WGI index levels around the world at any single point in time has the potential shortcoming of providing a biased understanding of the data if the WGI levels depicted differ widely from those in the rest of the time period. In order to address this shortcoming, Figure 15(c) presents the ten-year average of the WGI index across the world for the years 2002-2011; averaging the WGI index over the entire 2002-2011 time span makes this map less likely to depict WGI scores that are

heavily driven by any one particular year. The maps presented in Figure 11 and Figure 15(c) are very consistent with each other, with a few exceptions like China, Indonesia, and a few Latin American countries, whose WGI index scores were higher in 2011 than they were on average throughout the rest of the 2002-2011 period. Again, from this figure, no severe anomalies are apparent in the dataset, which provides confidence in the empirical methods and the results presented in the next two chapters.

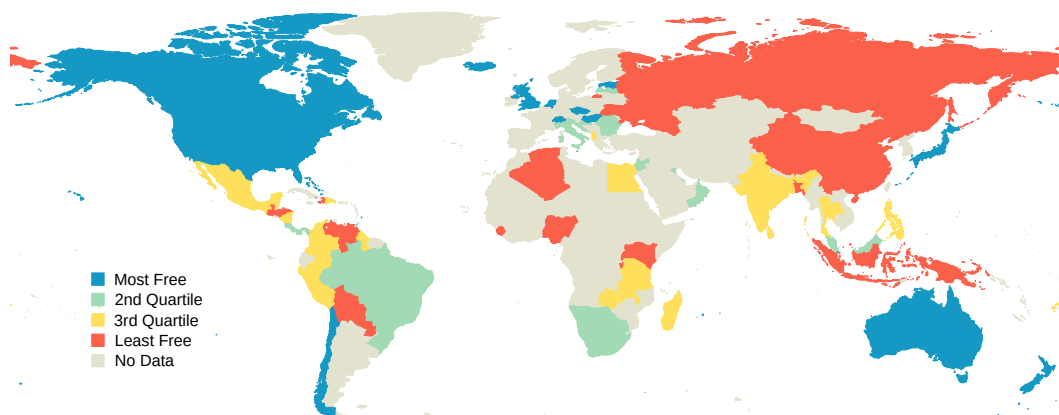
Figure 15: Ten-year Average of Lending Rates and Institutional Indexes



(a) Economic Freedom of the World Index



(b) Private Lending Rates



(c) Worldwide Governance Indicators Index

METHODS

The main methodological objective of this research is to attain a model specification for the relationship between institutional development and private lending rates that is comprehensive, valid, robust, and parsimonious. In order to achieve this objective, the empirical methods presented in this chapter will: (1) make ample use of the available theoretical and empirical literature; (2) justify all decisions made in regard to the model specifications; (3) apply extensive robustness tests to the results obtained, in order to account for sensitivity issues in an empirical fashion; and (4) favor simple and tractable methods over methods that add complexity without delivering much in terms of added benefits.

This chapter begins by presenting the core model specification, then proceeds to addressing some potential specification issues common in these types of studies. The main specification issues addressed in this chapter are: (1) sensitivity to estimation procedure; (2) sensitivity to sample selection; (3) sensitivity to variable selection; and (4) sensitivity to aggregation of the indexes.

The literature on sensitivity testing follows two main general approaches. The first approach limits testing to a set of model specifications that fall closely within preestablished economic paradigms. This is an '*a priori*' approach to sensitivity testing; under this approach, the researcher first lays out a sound theoretical framework for each specification being included in the analysis, and then proceeds to testing the robustness of the results against each one of these specifications. The second approach is less

constricting about the set of potential model specifications to be considered in the testing. This ‘*a posteriori*’ approach to sensitivity testing reduces the weight assigned to *a priori* theoretical inclinations and instead allows the empirical analysis to have a greater influence in shaping testing decisions (think of it as Bayesian approach to sensitivity testing).¹⁹

This latter approach has been proposed as a way of combating *data mining* concerns. In this context, data mining is defined as the practice of including and excluding variables in a haphazard fashion in an empirical model in order to obtain desirable results. Data mining is a popular concern in the empirical literature on institutions (Levine and Renelt, 1992; Przeworski and Limongi, 1993).

There is no general agreement on which one of the two above approaches to sensitivity testing is more advantageous. Some influential authors emphatically advocate for the use of *a posteriori* approaches to sensitivity testing such as Extreme Bound Analysis (Leamer, 1983). On the other hand, others like Lawson (2006) believe that “turning the research process over to a machine is worse than the data mining crime that it is meant to combat.” Despite these disagreements, there is nothing in the literature that prevents both the *a priori* and the *a posteriori* methods to be utilized in a complementary fashion in order to develop a comprehensive approach to sensitivity testing. This chapter employs both approaches to sensitivity testing. The results reported are selected on the basis of strong foundations on both theoretical and empirical grounds; the entire array of sensitivity tests is available from the author upon request.

¹⁹See Leamer (1985) for further detail on this latter approach.

Core Model Specification

In order to attain a comprehensive model specification for the relationship between institutional development and private lending rates it is important to make ample use of the available theoretical and empirical literature. In accordance with the literature examined in Chapter 2, a model of the following form is developed for this paper:

$$Y_{it} = \alpha + \beta X_{it} + \gamma W_{it} + \delta Z_t + \epsilon_{it}, \quad (2)$$

where Y represents the dependent variable (private lending rates) for the i th country and year t , α represents an intercept adjustment term, X represents a set of institutional variables, W represents a set of national macroeconomic variables, Z represents a set of international macroeconomic variables, and ϵ denotes an idiosyncratic error term. Each variable is appropriately indexed by country (i) and/or year (t), hence denoting the panel structure of the data used in this study.

More formally, the model presented in Equation 2 can be expressed in functional form as

$$Y = f(X, W, Z) + \epsilon.$$

The decision to develop a core model specification for this study that follows a linear functional form is made after finding no empirical, theoretical, or statistical reason to

sacrifice the parsimony of this model in favor of higher-dimensional forms.²⁰

Finally, the core model can be fully specified in terms of the variables used in this research by applying the labeling conventions developed in Chapter 4 as follows: The dependent variable (Y) used in this analysis is *intrate*, the set of institutional variables (X) is consolidated into either the EFW or the WGI index, the national macroeconomic controls (W) are *GDP1000*, *infGDPD*, *linf*, *infdiff*, and *linfdiff*. Lastly, *US10nir* is used as a control for the international macroeconomic environment (Z).

Sensitivity Analysis

In order to attain a robust model specification for the relationship between institutional development and private lending rates, it is of critical importance that extensive sensitivity testing be applied to the results obtained in this study. This paper seeks to accomplish this objective by conducting a broad array of robustness tests exploring issues like: (1) sensitivity to estimation procedure; (2) sensitivity to sample selection; (3) sensitivity to measuring error; (4) sensitivity to variable selection; (5) sensitivity to aggregation of the indexes; and (6) sensitivity to the inclusion of level, change and lag variables into the model.

Estimation Procedure

Chapter 4 provided a preliminary examination of the panel structure exhibited by the data used in this study. Both the temporal and the cross-sectional dimensions of the

²⁰For further details on the empirical and theoretical arguments supporting this claim, please refer to Chapter 2 and Chapter 3. On statistical grounds, it is found that the already comprehensive structure of the empirical model developed in this study faces serious over-identification issues under higher-dimensional forms.

data were analyzed, and the critical loss of information that could arise from neglecting to account for either one of these two dimensions was visually highlighted. This section, in turn, formalizes this paper's structural framework designed to duly account for both the temporal and the cross-sectional components of the data in a statistical fashion.

In order to account for these two dimensions, this study develops an approach that consists of running four parallel Ordinary Least Squares (OLS) estimation procedures for each model specification considered in this research: (1) pooled country-time OLS; (2) OLS model with year fixed effects; (3) OLS model with country fixed effects; and (4) OLS model with year and country fixed effects.²¹

As discussed in Chapter 2, the preferred estimation procedure used by the vast majority of the studies in the empirical literature on institutions is pooled OLS. The pooled OLS procedure has the advantage of increasing the sample size available for the estimation of the regression coefficients in the model, which in turn enables the researcher to obtain estimators with higher precision and test statistics with superior statistical power (Wooldridge, 2012). Generally, researchers attempting to investigate the relationship between institutions and economic performance in an empirical fashion have encountered difficulties in gaining access to large datasets reliably measuring institutional development across the world. As a result, the opportunity of being able to pool data from across the world collected at different points in time has been welcomed by most researchers in this area. Hence, in following with the literature, the first of the four parallel estimation

²¹Time-series issues like autocorrelation are also considered in this study; however, due to the short dimensionality of the data, the results of these tests are not deemed to be sufficiently reliable to be presented in this paper. As more years of data become available, it will be important to revisit these issues.

procedures used in this study is a pooled OLS estimation of the form:

$$intrate_{it} = \alpha + \beta_0 EFW_{it} + \beta_1 GDP1000_{it} + \beta_2 linfo_{it} + \beta_3 info_{it} + \beta_4 US10nir_t + \epsilon_{it} \quad (3)$$

This procedure, however, has the major shortcoming of neglecting to account for both the temporal and the cross-sectional dimensions of the data; hence, if a significant level of unobserved heterogeneity exists either across the years or across the countries in the data, the inferences drawn from the pooled OLS procedure are not valid. In order to partially alleviate this concern, the second of the four parallel estimation procedures used in this study is a year-fixed effect OLS model. This procedure essentially consists of including year dummy variables (D_t) in the model.²² The inclusion of these dummy variables seeks to account for the potential variation in private lending rates explained exclusively by the variation in time:

$$intrate_{it} = \alpha + \beta_0 EFW_{it} + \beta_1 GDP1000_{it} + \beta_2 linfo_{it} + \beta_3 info_{it} + \delta_t D_t + \epsilon_{it}. \quad (4)$$

Another way to partially alleviate the concerns raised by the use of a pooled OLS estimation procedure is by adding country-fixed effects to the model specification; this is precisely what the third of the four parallel estimation procedures used in this study does. This procedure essentially consists of including country dummy variables (C_i) in the model.²³ The inclusion of these dummy variables seeks to account for the potential

²²The base year 2002 is not assigned a dummy variable in order to avoid multicollinearity issues.

²³The base country USA is not assigned a dummy variable in order to avoid multicollinearity issues.

variation in private lending rates explained exclusively by the variation in country-specific characteristics:

$$intrate_{it} = \alpha + \beta_0 EFW_{it} + \beta_1 GDP1000_{it} + \beta_2 linfo_{it} + \beta_3 info_{it} + \beta_4 US10nir_t + \gamma_i C_i + \epsilon_{it} \quad (5)$$

The last of the four parallel estimation procedures used in this paper accounts for the possibility that variations across countries and time may jointly impact interest rates. This estimation procedure essentially consists of allowing for the presence of both year dummy variables (D_t) and country dummy variables (C_i) in the model:

$$intrate_{it} = \alpha + \beta_0 EFW_{it} + \beta_1 GDP1000_{it} + \beta_2 linfo_{it} + \beta_3 info_{it} + \delta_t D_t + \gamma_i C_i + \epsilon_{it} \quad (6)$$

As a group, these four estimation procedures test whether the temporal and cross-sectional dimensions of the data may be driving the results.²⁴ It is worth noting that the set of economic control variables contained in each one of the specifications changes slightly depending on the model in order to account for the particular statistical properties of each regression. For instance, *US10nir* is not included on the regressions with time dummies, as this would cause perfect collinearity issues. The differenced measures of inflation are not used in these regressions either, as there is no longer a benefit to subtracting the US inflation rate from the national inflation rates.

Lastly, having explicitly defined the four estimation procedure above, the

²⁴An additional empirical examination of the potential influence of any given year on the results is presented in Appendix D.

hypotheses outlined in Chapter 3 can now be stated in formal notation as in Table 2; the notation used for defining the parameters in this table follows from Equation 3:

Table 2: Expected Sign of Regression Coefficients

Variable	Coefficient	Expected Sign
<i>EFW</i>	β_0	–
<i>GDP1000</i>	β_1	+ / –
<i>lnfdiff</i>	β_2	+
<i>infdiff</i>	β_3	+
<i>US10nir</i>	β_4	+

Endogeneity Concerns

“The distinction between ‘exogenous’ and ‘endogenous’ variables in a model is a subtle and sometimes controversial complication.” Greene (2003)

As documented in Chapter 2, a large body of empirical research has found a positive relationship between the Economic Freedom of the World index and economic growth, where growth is measured by some function of the national gross domestic product. Additionally, Chapter 2 also documents several studies suggesting a possible link between gross domestic product and several measures of country-level financial performance. Though no strong empirical evidence exists of a connection between GDP and private lending rates, this study deems it important to include some function of the national level of GDP in its empirical analysis in order to duly account for this potential relationship. Including GDP per capita into the model allows the estimation procedure to isolate the relationship between the EFW index and private lending rates from the potential relationship between GDP and private lending rates.

However, including GDP per capita into the model raises some classic concerns about the potential endogeneity of this indicator (Acemoglu et al., 2000). Endogeneity concerns arise when at least one of the independent variables included in a regression model is correlated with the idiosyncratic error term. In other words, a variable like GDP raises endogeneity concerns whenever it is believed to be correlated with a determinant of the dependent variable that is not being explicitly included in the model. Endogeneity issues cause one of the critical assumptions of OLS estimation to be violated, which in turn makes the estimation results no longer valid (Wooldridge, 2012).

This study addresses these concerns about the potential of endogeneity of GDP in two ways: (1) through the implementation of a two-stage least squares (2SLS) instrumental variable procedure; and (2) by examining the sensitivity of the study's results to the inclusion of GDP as an independent variable in the model.

The use of instrumental variable (IV) regressions is one of the most popular solutions to endogeneity concerns in the literature (Wooldridge, 2012). However, finding variables that are good instruments is generally a challenge; whenever the instruments used in the regression lack either relevance or exogeneity, large inconsistencies in the IV estimates can arise (Bound et al., 1995). The variable used to instrument for GDP per capita in the IV estimation procedure implemented in this study is *health expenditure per capita*. This variable is measured in current US dollars, and it is obtained from the World Bank's World Development Indicators. The results of implementing this procedure do not provide significant evidence suggesting that GDP is an endogenous variable in the

model.²⁵

The second approach used in this study to address endogeneity concerns consists of defining four new OLS estimation procedures to be run alongside the original models presented earlier in this Chapter. These four new procedures are analogous those presented in Equations 3-6, but they do not include *GDP1000* as a regressor:

$$intrate_{it} = \alpha + \beta_0 EFW_{it} + \beta_1 linfo_{it} + \beta_2 info_{it} + \beta_3 US10nir_t + \epsilon_{it} \quad (7)$$

$$intrate_{it} = \alpha + \beta_0 EFW_{it} + \beta_1 linfo_{it} + \beta_2 info_{it} + \delta_t + \epsilon_{it} \quad (8)$$

$$intrate_{it} = \alpha + \beta_0 EFW_{it} + \beta_1 linfo_{it} + \beta_2 info_{it} + \beta_3 US10nir_t + \gamma_i + \epsilon_{it} \quad (9)$$

$$intrate_{it} = \alpha + \beta_0 EFW_{it} + \beta_1 linfo_{it} + \beta_2 info_{it} + \delta_t + \gamma_i + \epsilon_{it}. \quad (10)$$

This approach seeks to examine the sensitivity of the results of this study to the inclusion of GDP as an independent variable in its models. The basic concept motivating this method is that, if GDP is indeed causing a critical violation of one the underlying assumptions of OLS estimation, the exclusion of this variable from the models should produce a dramatic alteration in the results. The results obtained under the implementation of this approach are presented and examined in Chapter 6.

Sample Selection

When addressing the issue of model specification, another major concern is generally raised by the potential sensitivity of the results to the sample used to run the

²⁵These results are available from the author upon request.

analysis. This research addresses this concern by testing the robustness of the results against a wide variety of sample selections. The results are found to display a large degree of robustness to these specifications. The samples best justified by economic and statistical theory are summarized in Table 3.

Table 3: Sample Selection

Sample	Observations dropped from original dataset	Sample Size	
		EFW	WGI
N2002	Years before 2002.	1056	1538
N1035	Outliers of lending rate and inflation above the 99th percentile, missing data for EFW areas, and years before 2002.	1035	1035
N1006	N1035 minus EFW areas without variation.	1006	1006
N234	Outliers of lending rate and inflation above the 99th percentile and relevant EFW components without variation or missing.	234	234
N1509	Outliers of lending rate and inflation above the 99th percentile, missing data for WGI areas, and years before 2002.	1033	1509
N1506	N1509 minus WGI areas without variation.	1033	1506

The sample N2002 is considered of relevance for three reasons: (1) given that 2002 is the earliest year from which both the EFW and the WGI indexes have yearly data, this sample represents a natural starting point for comparability; (2) though the EFW index has data back to 1970, many changes have occurred since its first publication, with 2002 being the last year when major methodological changes were introduced (De Haan et al., 2006); (3) though simplistic, the lack of *a priori* judgments in constructing this

data-set can be seen as valuable in avoiding sample selection bias.²⁶

The N1035 sample is considered of relevance for two main reasons: (1) it drops outliers of the private lending rate and inflation variables, keeping only the bottom 99th percentile of the data, and thereby ensuring that the results are not merely being driven by these outliers; and (2) it ensures that all the regressions are run on the exact same observations, in order to ensure that the differing observations are not driving the results. Sample N1035 is designated as the base sample for this thesis due to its elemental structure.

The N1006 sample is very similar to the N1035 sample but it has an additional level of statistical refinement: The countries with EFW areas, private lending rates, *GDP1000*, and inflation measures that do not present any variation across time within country are omitted from the estimation. This is done because including these observations can affect the standard error of the coefficients in ways that are not predictable. A mathematical derivation of this phenomenon is presented in Appendix B. The N234 sample takes this concern a step further and it explores what happens to the results when several relevant sub-components that do not experience time variation within a country are dropped from the data.²⁷

Lastly, samples N1509 and N1506 are constructed as the WGI analogues to samples N1035 and N1006, respectively. These samples are considered to be relevant

²⁶Some of the fundamental variations in the different EFW reports published before 2002 are: (1) the countries for which data is presented; (2) the aggregation techniques; and (3) the components measured by the index.

²⁷The relevance of the sub-components considered in the creation of this sample is assessed based on economic and statistical theory. The sub-components taken into consideration are: transfer of subsidies, judicial independence, impartial courts, protection of property rights, integrity of the legal system, contract enforcement, regulatory trade barriers, credit regulation, and business regulation.

insofar as they are tailored specifically for the WGI data-set. This step is taken in order to add a certain systematic nature to the sample selection process for the WGI data-set. It is noted that samples N1509 and N1506 turn out to be quite similar; however, they are both taken into consideration in this study given that their derivation is thought to be fundamentally different, which makes their independent results relevant from a sensitivity analysis point.

Measuring Error

In order to account for concerns of measuring error of the independent institutional variables, each permutation of the above specifications is run using first the EFW index, and then the WGI index.

One of the advantages of using the two institutional measures chosen by this study is that both of them examine institutional strength from different angles. One of them uses objective data to capture institutional development in the form of economic freedom; the other one uses perception data to capture institutional development in the form of governance. Hence, these two alternative measures of institutional development complement each other in important ways, which makes the empirical analysis of this study more comprehensive.

Variable Selection

Another specification issue that is likely to significantly affect the results is that of selecting the independent variables to be included in the model. As mentioned in earlier chapters, given the nature of institutional data, disaggregating the overall institutional

indexes into their components and including them into a regression separately causes the problem of multicollinearity to arise. On the other hand, including only a subset of these components in the model is likely to generate the problem of omitted variable bias. This study addresses these concerns by only including an overall index as the institutional explanatory variable in the model; this section presents several reasons that support the validity of this decision.

First, statistical diagnostics and empirical analyses corroborate the fact that the components of both institutional indexes present multicollinearity issues. In Chapter 3, an argument based on economic theory was presented for the high linear dependency among the components of each institutional index. Statistically, these high linear dependencies are corroborated in three ways in this study. The first is by examining the simple correlation coefficients among the components; the second is by means of condition number analysis; and the third is by running regressions using all components as explanatory variables. The correlation matrices are presented and discussed in Chapter 6; the condition number analysis is presented and discussed in Appendix A. The results of the regressions using all components of each index as regressors show classic signs of collinearity, coefficients switching signs and coming in and out of significance with small changes in model specification.²⁸

Second, it bypasses the problem of bias in the variable selection process. If not all institutional variables are to be included in the model in order to avoid collinearity issues, the selection of which variables to include and which to exclude must abide by some

²⁸A comprehensive result of these regressions is available upon request.

selection criteria. However, given the sensitivity of the results to the specification of explanatory variables, virtually all selection criteria raise a concern for bias. The construction of the EFW and the WGI data-sets predate the hypotheses tested in this research; hence, aggregating *all* of the variables presented in each one of these data-sets makes the variable selection process both comprehensive and unbiased while still avoiding collinearity issues.

Third, given that each institutional variables within the two data-sets considered in this study was constructed by following the same methodological procedure and with the same measuring objective in mind, it is not unreasonable to think of these variables as composing the same bundle. For instance, all of the areas of the EFW data-set were constructed following the methodological principle that they should be derived from objective macroeconomic measures. Also, they all seek to gather information that measures the degree of economic freedom within a nation. Hence, it is not unreasonable to think that all of the measures of economic freedom based on objective macroeconomic indicators may affect credit risk in a relatively homogenous fashion.

Fourth, aggregating the institutional data into an overall index is not inconsistent with the theoretical framework presented in Chapter 3. Though an economic argument can be made for different institutional variables potentially having different effects on the dependent variable when considered individually, it would be difficult to find an economic argument to claim definitively that these variables do not reinforce each other when considered as a whole.

Aggregation Sensitivity

Another potential sensitivity concern stems from the way in which the individual institutional areas are aggregated to form an overall index. As explained above, this research uses the aggregate measure of institutional indexes as an explanatory variable. However, studies like Heckelman and Stroup (2005) point out that the method used for aggregating institutional variables into an overall index can have a significant effect on both the ordinal and cardinal properties of the index, and on the subsequent analyses based on said aggregate measure. In light of these concerns, Heckelman and Stroup (2005) call into question the reliability of a vast portion of the results presented by the growing body of literature on economic freedom; they add, however, that the lack of reliability of these results does not stem from the indexes themselves, but rather from a failure to properly address the issue of sensitivity to aggregation methods.

Given the decision of this study to aggregate the institutional measures into an overall index, these concerns must be duly addressed. First, the study addresses this concern by maintaining internal consistency with regards to its aggregation methods. That is, both the EFW index and the WGI index are obtained by means of the same aggregation procedure; this procedure is maintained constant throughout all model specifications estimated in this paper.

Second, the simple average aggregation procedure favored by this study is consistent with the standard method employed by the Fraser Institute in its EFW publications since 2002 (De Haan et al., 2006). Given the predominance of the EFW

measures in the institutional literature, the simple average aggregation procedure has also become the standard of the literature. Utilizing this aggregation procedure, then, increases the comparability of this study with other studies and also increases the relevancy to future research.

And third, it is worth noting that even the more sophisticated aggregation methods have their own methodological and interpretations shortcomings. As mentioned earlier, for instance, principal component analysis (PCA) has been suggested as a way of dealing with multicollinearity issues (Naes and Mevik, 2001; Greene, 2003). The idea behind this procedure is to reduce the dimensionality of the data, while retaining the majority of the information. Moreover, PCA offers a way of maintaining a large degree of orthogonality among the independent variables. However, this procedure creates concerns of (1) subjectivity, and (2) interpretation.

The subjectivity concern associated with PCA arises from the procedure used in selecting the principal components that will ultimately be considered in the model: should all principal components be included? The answer is generally no. However, if not all components are to be used, what procedure should be used in selecting those that are to be used? Moreover, what new sensitivities could these new subjective choices have on the results?

Even if some methodical explanation could be given as to why a method of selecting the right components is to be used over the rest, some concerns about interpretation would remain. These interpretation concerns arise because the principal components are essentially generated by a weighted average of the original regressors.

Hence, the sense of the original regressors is lost, and the new regressors do not always have a clear interpretation. For an example, consider a principal component generated by the formula $PC_1 = 1/3govsize + 2/3lnprights - 1/2clbreg$, where *govsize*, *lnprights*, and *clbreg* measure the size of government, the quality of legal and property rights, and the level of regulation, respectively. Suppose that the regression result yield a significantly positive effect of PC_1 on private lending rates. What practical economic interpretation could be derived from this? The answer is not clear.

The more sophisticated aggregation methods are generally more costly to implement; in contrast, given the reasons outlined above, there is no clear benefit to deviate from a simple average aggregation procedure.²⁹

In summary, using a simple average as the aggregation method for the institutional indexes is favored in this paper for three main reasons: (1) it is the aggregation method that has been used consistently by the Fraser institute since 2002; (2) it is the standard aggregation method of the literature; and (3) even the more complex aggregation methods come with their own set of difficulties. All of these reasons make the cost of adopting a new and unpublished aggregation method greater than the benefits.

29

This study briefly examined the qualitative results herein presented under the use of PCA. The conclusions obtained through the use of PCA do not change the main results presented in this manuscript in a significant fashion. A more in-depth consideration of this issue may possibly shed a clearer light on the individual importance of each one of the areas that compose the institutional indexes considered in this paper.

Level, Changes, and Lags

Lastly, it is worth presenting a brief discussion of the relevance and differences of specifying the model by using the level version of the variables, the change, or their lags. The cost in terms of degrees of freedom of lagging the inflation controls is negligible, as there is relatively large time dimension for this particular set of variables. However, the cost is much higher when it comes to the institutional indexes, given their already short time component. Lawson (2006) addresses this specification issue. The author of this manuscript agrees that a more ideal specification might include a one-year lag of the EFW index, as well as the change in EFW as independent variables. However, the cost of doing so for this particular study does not seem to justify the specification benefits. Future research will be better able to test the robustness of the results presented in this paper to these alternative model specifications, as more become available.

RESULTS

This chapter presents the main results obtained in this study. The results are presented in three sections: the first section presents results using the Economic Freedom of the World index as the institutional variable under the sample N1035; the second section presents results using the Economic Freedom of the World index as the institutional variable under the sample N234; and the third section presents results using the Worldwide Governance Indicators index as the institutional variable under the sample N1506. The remaining results are included in Appendix E.

The results are presented in this fashion in order to provide a broad perspective of what happens when the empirical analysis is estimated under different specifications: the sample N1035 is the least restrictive of the three samples constructed based on the EFW dataset; the sample N234, on the other hand is the most restrictive of the three samples based on the EFW dataset; lastly, the sample N1506 is chosen as a robustness check.

Sample N1035

This section explores the results based on sample N1035. This sample is defined as follows: (1) outliers corresponding to the top one percentile of private lending rates and inflation are dropped; (2) observations from years previous to 2002 are dropped; and (3) observations missing any of the areas of the EFW index or any of the control variables are dropped.

Table 4 presents the results of regressing the EFW index on private lending rates with a variety of controls that include GDP; all regressors presented in this table are in

their standardized form. Column (1) presents the results under a base pooled OLS estimation specification. Column (2) adds year fixed effects to the base model from Column (1). Column (3) adds country fixed effects to the base model in Column (1). Column (4) presents the results when both year and country effects are added to the base model in Column (1). Under these four model specifications, the coefficient associated with the Economic Freedom of the World index is consistently negative and statistically significant, and it ranges in magnitude between -0.242 and -0.099. The interpretation of the results in this table suggest that a one standard deviation increase in the Economic Freedom of the World index is associated with a decrease in private lending rates of roughly 0.177 standard deviations in Model (1). Moreover, the magnitude of the EFW coefficient is consistently comparable to that of the *aggregate* coefficient for inflation in all models.³⁰ This indicates that the impact of the EFW index on interest rates is comparable to that of inflation; which in turn suggests the economic importance of the EFW index in addition to its statistical significance. In addition, inflation and the US Treasury rates appear to be positively, significantly, and robustly linked to the private lending rates, as expected; GDP, however, appears to be sensitive to model specification. Lastly, it is worth highlighting the relatively high overall fit of the four model specifications; as measured by their R^2 , the overall “fit” of these models ranges from 34% to 86%.

³⁰The aggregate coefficient for inflation is defined as the sum of the inflation variables in each model, and it captures the total effect of inflation on interest rates. For example, in Model (1) of Table 4, the aggregate coefficient for inflation is computed as the sum of the coefficient for *zinfdiff* (0.202) and the coefficient for *zlinfdiff* (0.194), which results in an aggregate inflation coefficient of 0.396. Therefore, in this case, the magnitude of the EFW coefficient is about half as large as that of the aggregate coefficient for inflation. This relative magnitude oscillates between roughly 0.5 and 1 for all models in this table.

Table 5 presents the results of regressing the EFW index on private lending rates under a variety of controls that do not include GDP; all regressors presented in this table are in their standardized form. Column (1) presents the results under a base pooled OLS estimation specification. Column (2) adds year fixed effects to the base model from Column (1). Column (3) adds country fixed effects to the base model in Column (1). Column (4) presents the results when both year and country effects are added to the base model in Column (1). Under these four model specifications, the coefficient associated with the standardized measure of the Economic Freedom of the World index is consistently negative and statistically significant, and it ranges between -0.300 and -0.113. Moreover, the magnitude of the EFW coefficient remains consistently comparable to that of the *aggregate* coefficient for inflation in all models, which indicates economic importance in addition to statistical significance. Inflation appears to be positively, significantly, and robustly linked to the private lending rates, as expected. The coefficient for the US Treasury rates remains consistently positive, however, it loses some of its significance under the pooled OLS model. Lastly, it is worth highlighting the relatively high overall fit of the four model specifications; as measured by their R^2 , the overall “fit” of these models ranges from 31% to 86%.

Table 4: EFW Index Results under Sample N1035 (GDP Included)

VARIABLES	(1) OLS	(2) Year	(3) Country	(4) Country & Year
zEFW	-0.177*** (0.0342)	-0.155*** (0.0347)	-0.242*** (0.0483)	-0.0986* (0.0518)
zGDP1000	-0.214*** (0.0322)	-0.225*** (0.0323)	-0.317 (0.202)	0.546** (0.228)
zlinfdiff	0.194*** (0.0286)		0.0962*** (0.0169)	
zinfdiff	0.202*** (0.0289)		0.119*** (0.0177)	
zUS10nir	0.0438* (0.0257)		0.0513*** (0.0140)	
zlinfl		0.198*** (0.0297)		0.0938*** (0.0171)
zinfGDPD		0.227*** (0.0303)		0.143*** (0.0179)
Constant	2.97e-10 (0.0254)	0.244*** (0.0822)	0.00694 (0.170)	0.704*** (0.190)
Observations	1,035	1,035	1,035	1,035
R ²	0.335	0.346	0.845	0.856
Year FE	NO	YES	NO	YES
Country FE	NO	NO	YES	YES

Notes: All variables presented in this table have been standardized. The dependent variable is *intrate*, which represents the average national bank rate that usually meets the short-term and medium-term financing needs of the private sector. *EFW* represents the overall Economic Freedom of the World Index. *GDP1000* represents the national gross domestic product in thousands of constant 2005 U.S. dollars, divided by midyear population. The variable *infGDPD* represents inflation, as measured by the annual growth rate of the GDP implicit deflator. The variable *infdiff* is calculated by subtracting the US inflation rate from *infGDPD*. *US10nir* represents the annual nominal interest rate of 10-year U.S. Treasury bank notes. *linf* and *linfdiff* are the one-year lag value of *infGDPD* and *linfdiff*, respectively. Column (1) presents the results yielded by pooled OLS estimation. Column (2) presents the results yielded by including year fixed effects into the base model specification. Column (3) presents the results yielded by including country fixed effects into the base model specification. Column (4) presents the results yielded by including both year and country fixed effects into the base model specification. Standard errors are presented in parentheses. The standard notation is used to denote the level of statistical significance of each result: *** p<0.01, ** p<0.05, * p<0.1.

Table 5: EFW Index Results under Sample N1035 (GDP Not Included)

VARIABLES	(1) OLS	(2) Year	(3) Country	(4) Country & Year
zEFW	-0.300*** (0.0294)	-0.286*** (0.0297)	-0.250*** (0.0480)	-0.113** (0.0516)
zlinfdiff	0.208*** (0.0291)		0.0953*** (0.0169)	
zinfdiff	0.209*** (0.0294)		0.116*** (0.0177)	
zUS10nir	0.0351 (0.0262)		0.0556*** (0.0137)	
zlinfl		0.213*** (0.0303)		0.0948*** (0.0171)
zinfGDPD		0.232*** (0.0310)		0.143*** (0.0180)
Constant	4.01e-10 (0.0259)	0.205** (0.0839)	0.171 (0.135)	0.387*** (0.136)
Observations	1,035	1,035	1,035	1,035
R ²	0.306	0.315	0.845	0.856
Year FE	NO	YES	NO	YES
Country FE	NO	NO	YES	YES

Notes: All variables presented in this table have been standardized. The dependent variable is *intrate*, which represents the average national bank rate that usually meets the short-term and medium-term financing needs of the private sector. *EFW* represents the overall Economic Freedom of the World Index. *GDP1000* represents the national gross domestic product in thousands of constant 2005 U.S. dollars, divided by midyear population. The variable *infGDPD* represents inflation, as measured by the annual growth rate of the GDP implicit deflator. The variable *infdiff* is calculated by subtracting the US inflation rate from *infGDPD*. *US10nir* represents the annual nominal interest rate of 10-year U.S. Treasury bank notes. *linf* and *linfdiff* are the one-year lag value of *infGDPD* and *linfdiff*, respectively. Column (1) presents the results yielded by pooled OLS estimation. Column (2) presents the results yielded by including year fixed effects into the base model specification. Column (3) presents the results yielded by including country fixed effects into the base model specification. Column (4) presents the results yielded by including both year and country fixed effects into the base model specification. Standard errors are presented in parentheses. The standard notation is used to denote the level of statistical significance of each result: *** p<0.01, ** p<0.05, * p<0.1.

Sample N234

This section explores the results based on sample N234. This sample is defined as follows: (1) outliers corresponding to the top one percentile of private lending rates and inflation are dropped; (2) observations from years previous to 2002 are dropped; (3) observations missing values for a set of relevant components of the EFW index or any of the control variables are dropped; and (4) countries without variation in the set of relevant components are dropped.³¹

Table 6 presents the results of regressing the EFW index on private lending rates under a variety of controls that include GDP; all regressors presented in this table are in their standardized form. Column (1) presents the results under a base pooled OLS estimation specification. Column (2) adds year fixed effects to the base model from Column (1). Column (3) adds country fixed effects to the base model in Column (1). Column (4) presents the results when both year and country effects are added to the base model in Column (1). Under these four model specifications, the coefficient associated with the standardized measure of the Economic Freedom of the World index is consistently negative and statistically significant, and it ranges in magnitude between -0.277 and -0.159. Moreover, the magnitude of the EFW coefficient remains consistently comparable to that of the *aggregate* coefficient for inflation in all models, which indicates economic importance in addition to statistical significance. Inflation appears to be

³¹The relevance of the sub-components considered in the creation of this sample is assessed based on economic and statistical theory. The sub-components taken into consideration are: transfer of subsidies, judicial independence, impartial courts, protection of property rights, integrity of the legal system, contract enforcement, regulatory trade barriers, credit regulation, and business regulation.

positively, significantly, and robustly linked to the private lending rates, as expected. The coefficient for the US Treasury rates remains consistently positive, however, it loses some of its significance under the pooled OLS model. Lastly, the GDP indicator remains sensitive to model specification.

Table 7 presents the results of regressing the EFW index on private lending rates under a variety of controls that do not include GDP; all regressors presented in this table are in their standardized form. Column (1) presents the results under a base pooled OLS estimation specification. Column (2) adds year fixed effects to the base model from Column (1). Column (3) adds country fixed effects to the base model in Column (1). Column (4) presents the results when both year and country effects are added to the base model in Column (1). Under these four model specifications, the coefficient associated with the standardized measure of the Economic Freedom of the World index is consistently negative and statistically significant, and it ranges between -0.341 and -0.182. Moreover, the magnitude of the EFW coefficient remains consistently comparable to that of the *aggregate* coefficient for inflation in all models, which indicates economic importance in addition to statistical significance. Inflation appears to be positively, significantly, and robustly linked to the private lending rates, as expected. The coefficient for the US Treasury rates remains consistently positive, however, it loses some of its significance under the pooled OLS model.

Table 6: EFW Index Results under Sample N234 (GDP Included)

VARIABLES	(1) OLS	(2) Year	(3) Country	(4) Country & Year
zEFW	-0.179** (0.0907)	-0.166* (0.0922)	-0.277*** (0.0698)	-0.159** (0.0711)
zGDP1000	-0.223** (0.0863)	-0.223** (0.0875)	-0.185 (0.199)	0.564** (0.226)
zlinfdiff	0.166*** (0.0626)		0.0703*** (0.0207)	
zinfdiff	0.105* (0.0630)		0.0538** (0.0211)	
zUS10nir	0.0755 (0.0574)		0.0731*** (0.0182)	
zlinfl		0.173*** (0.0663)		0.0652*** (0.0200)
zinfGDPD		0.130* (0.0683)		0.0775*** (0.0208)
Constant	-2.45e-09 (0.0564)	0.281 (0.193)	-0.132 (0.150)	0.671*** (0.196)
Observations	234	234	234	234
R ²	0.272	0.284	0.940	0.952
Year FE	NO	YES	NO	YES
Country FE	NO	NO	YES	YES

Notes: All variables presented in this table have been standardized. The dependent variable is *intrate*, which represents the average national bank rate that usually meets the short-term and medium-term financing needs of the private sector. *EFW* represents the overall Economic Freedom of the World Index. *GDP1000* represents the national gross domestic product in thousands of constant 2005 U.S. dollars, divided by midyear population. The variable *infGDPD* represents inflation, as measured by the annual growth rate of the GDP implicit deflator. The variable *infdiff* is calculated by subtracting the US inflation rate from *infGDPD*. *US10nir* represents the annual nominal interest rate of 10-year U.S. Treasury bank notes. *linf* and *linfdiff* are the one-year lag value of *infGDPD* and *linfdiff*, respectively. Column (1) presents the results yielded by pooled OLS estimation. Column (2) presents the results yielded by including year fixed effects into the base model specification. Column (3) presents the results yielded by including country fixed effects into the base model specification. Column (4) presents the results yielded by including both year and country fixed effects into the base model specification. Standard errors are presented in parentheses. The standard notation is used to denote the level of statistical significance of each result: *** p<0.01, ** p<0.05, * p<0.1.

Table 7: EFW Index Results under Sample N234 (GDP Not Included)

VARIABLES	(1) OLS	(2) Year	(3) Country	(4) Country & Year
zEFW	-0.341*** (0.0665)	-0.328*** (0.0677)	-0.285*** (0.0692)	-0.182** (0.0714)
zlinfdiff	0.180*** (0.0632)		0.0702*** (0.0207)	
zinfdiff	0.108* (0.0637)		0.0517** (0.0209)	
zUS10nir	0.0778 (0.0581)		0.0777*** (0.0175)	
zlinfl		0.187*** (0.0669)		0.0657*** (0.0203)
zinfGDPD		0.135* (0.0691)		0.0768*** (0.0210)
Constant	-3.11e-09 (0.0571)	0.285 (0.196)	-0.0225 (0.0932)	0.257** (0.106)
Observations	234	234	234	234
R ²	0.251	0.263	0.940	0.950
Year FE	NO	YES	NO	YES
Country FE	NO	NO	YES	YES

Notes: All variables presented in this table have been standardized. The dependent variable is *intrate*, which represents the average national bank rate that usually meets the short-term and medium-term financing needs of the private sector. *EFW* represents the overall Economic Freedom of the World Index. *GDP1000* represents the national gross domestic product in thousands of constant 2005 U.S. dollars, divided by midyear population. The variable *infGDPD* represents inflation, as measured by the annual growth rate of the GDP implicit deflator. The variable *infdiff* is calculated by subtracting the US inflation rate from *infGDPD*. *US10nir* represents the annual nominal interest rate of 10-year U.S. Treasury bank notes. *linf* and *linfdiff* are the one-year lag value of *infGDPD* and *linfdiff*, respectively. Column (1) presents the results yielded by pooled OLS estimation. Column (2) presents the results yielded by including year fixed effects into the base model specification. Column (3) presents the results yielded by including country fixed effects into the base model specification. Column (4) presents the results yielded by including both year and country fixed effects into the base model specification. Standard errors are presented in parentheses. The standard notation is used to denote the level of statistical significance of each result: *** p<0.01, ** p<0.05, * p<0.1.

Sample N1506

This section explores the results based on sample N1506. This sample is defined as follows: (1) outliers corresponding to the top one percentile of private lending rates and inflation are dropped; (2) observations from years previous to 2002 are dropped; (3) observations missing any of the areas of the WGI index or any of the control variables are dropped; and (4) countries without variation in the WGI areas are dropped.

Table 8 presents the results of regressing the WGI index on private lending rates under a variety of controls that include GDP; all regressors presented in this table are in their standardized form. Column (1) presents the results under a base pooled OLS estimation specification. Column (2) adds year fixed effects to the base model from Column (1). Column (3) adds country fixed effects to the base model in Column (1). Column (4) presents the results when both year and country effects are added to the base model in Column (1). Under these four model specifications, the coefficient associated with the standardized measure of the Worldwide Governance Indicators index is consistently negative and statistically significant, and it ranges in magnitude between -0.485 and -0.159. Moreover, the magnitude of the WGI coefficient remains consistently comparable to that of the *aggregate* coefficient for inflation in all models, which indicates economic importance in addition to statistical significance. Inflation and the US Treasury rates appear to be positively, significantly, and robustly linked to the private lending rates, as expected. The GDP indicator remains sensitive to model specification. Lastly, it is worth highlighting the relatively high overall fit of the four model specifications; as

measured by their R^2 , the overall “fit” of these models ranges from 38% to 85%.

Table 9 presents the results of regressing the WGI index on private lending rates under a variety of controls that do not include GDP; all regressors presented in this table are in their standardized form. Column (1) presents the results under a base pooled OLS estimation specification. Column (2) adds year fixed effects to the base model from Column (1). Column (3) adds country fixed effects to the base model in Column (1). Column (4) presents the results when both year and country effects are added to the base model in Column (1). Under these four model specifications, the coefficient associated with the standardized measure of the Worldwide Governance Indicators index is consistently negative and statistically significant, and it ranges between -0.492 and -0.317, with a mean of -0.395. In other words, the results of this table suggest that a one standard deviation increase in the Worldwide Governance Indicators index is associated with a decrease in private lending rates of roughly 0.40 standard deviations. Moreover, the magnitude of the WGI coefficient remains consistently comparable to that of the *aggregate* coefficient for inflation in all models, which indicates economic importance in addition to statistical significance. In addition, inflation and the US Treasury rates appear to be positively, significantly, and robustly linked to the private lending rates, as expected. Lastly, it is worth highlighting the relatively high overall fit of the four model specifications; as measured by their R^2 , the overall “fit” of these models ranges from 36% to 85%.

Table 8: WGI Index Results under Sample N1506 (GDP Included)

VARIABLES	(1) OLS	(2) Year	(3) Country	(4) Country & Year
zWGI	-0.159*** (0.0329)	-0.162*** (0.0327)	-0.485*** (0.0814)	-0.455*** (0.0788)
zGDP1000	-0.203*** (0.0309)	-0.198*** (0.0307)	-0.306** (0.120)	0.150 (0.126)
zlinfdiff	0.255*** (0.0242)		0.205*** (0.0146)	
zinfdiff	0.216*** (0.0245)		0.184*** (0.0145)	
zUS10nir	0.0717*** (0.0206)		0.0769*** (0.0118)	
zlinfl		0.246*** (0.0248)		0.194*** (0.0145)
zinfGDPD		0.233*** (0.0253)		0.198*** (0.0145)
Constant	3.22e-10 (0.0204)	0.276*** (0.0670)	-0.979*** (0.253)	-0.259 (0.256)
Observations	1,506	1,506	1,506	1,506
R ²	0.378	0.391	0.835	0.847
Year FE	NO	YES	NO	YES
Country FE	NO	NO	YES	YES

Notes: All variables presented in this table have been standardized. The dependent variable is *intrate*, which represents the average national bank rate that usually meets the short-term and medium-term financing needs of the private sector. *WGI* represents the overall Worldwide Governance Indicators Index. *GDP1000* represents the national gross domestic product in thousands of constant 2005 U.S. dollars, divided by midyear population. The variable *infGDPD* represents inflation, as measured by the annual growth rate of the GDP implicit deflator. The variable *infdiff* is calculated by subtracting the US inflation rate from *infGDPD*. *US10nir* represents the annual nominal interest rate of 10-year U.S. Treasury bank notes. *linf* and *linfdiff* are the one-year lag value of *infGDPD* and *linfdiff*, respectively. Column (1) presents the results yielded by pooled OLS estimation. Column (2) presents the results yielded by including year fixed effects into the base model specification. Column (3) presents the results yielded by including country fixed effects into the base model specification. Column (4) presents the results yielded by including both year and country fixed effects into the base model specification. Standard errors are presented in parentheses. The standard notation is used to denote the level of statistical significance of each result: *** p<0.01, ** p<0.05, * p<0.1.

Table 9: WGI Index Results under Sample N1506 (GDP Not Included)

VARIABLES	(1) OLS	(2) Year	(3) Country	(4) Country & Year
zWGI	-0.317*** (0.0226)	-0.317*** (0.0224)	-0.492*** (0.0815)	-0.454*** (0.0788)
zlinfdiff	0.247*** (0.0245)		0.206*** (0.0146)	
zinfdiff	0.205*** (0.0248)		0.181*** (0.0145)	
zUS10nir	0.0726*** (0.0209)		0.0837*** (0.0115)	
zlinfl		0.238*** (0.0251)		0.194*** (0.0145)
zinfGDPD		0.221*** (0.0255)		0.199*** (0.0145)
Constant	0 (0.0206)	0.281*** (0.0679)	-0.784*** (0.241)	-0.374 (0.238)
Observations	1,506	1,506	1,506	1,506
R ²	0.360	0.374	0.834	0.847
Year FE	NO	YES	NO	YES
Country FE	NO	NO	YES	YES

Notes: All variables presented in this table have been standardized. The dependent variable is *intrate*, which represents the average national bank rate that usually meets the short-term and medium-term financing needs of the private sector. *WGI* represents the overall Worldwide Governance Indicators Index. *GDP1000* represents the national gross domestic product in thousands of constant 2005 U.S. dollars, divided by midyear population. The variable *infGDPD* represents inflation, as measured by the annual growth rate of the GDP implicit deflator. The variable *infdiff* is calculated by subtracting the US inflation rate from *infGDPD*. *US10nir* represents the annual nominal interest rate of 10-year U.S. Treasury bank notes. *linf* and *linfdiff* are the one-year lag value of *infGDPD* and *linfdiff*, respectively. Column (1) presents the results yielded by pooled OLS estimation. Column (2) presents the results yielded by including year fixed effects into the base model specification. Column (3) presents the results yielded by including country fixed effects into the base model specification. Column (4) presents the results yielded by including both year and country fixed effects into the base model specification. Standard errors are presented in parentheses. The standard notation is used to denote the level of statistical significance of each result: *** p<0.01, ** p<0.05, * p<0.1.

In summary, the results yielded by this study suggest that: (1) institutions are inversely related to interest rates; (2) inflation and the US Treasury rates are positively related to interest rates; and (3) GDP appears to have no clear significant effect on interest rates. These results are consistent with the arguments made in previous chapters; moreover, they appear to be highly robust to a wide array of model specifications. Furthermore, not only are these results robust and statistically significant, they also appear to be highly relevant economically. In fact, the magnitude of the influence of institutions on private lending rates found in the results presented above is anywhere from about one half to two times as large as the influence of inflation.

Summary Results

Table 10 and Table 11 summarize the main results, and further illustrate their robustness. Since these tables are not meant to provide any information about relative magnitudes, there is no advantage in using the standardized form of the variables to estimate the results presented therein; instead, the original form of the variables is used, as they provide some valuable additional information about the results of this study.³²

Table 10 presents the magnitude and the standard error (in parentheses) of the coefficient for the Economic Freedom of the World index throughout the eight model specifications and the six sub-samples considered in this study. Column (1) presents the results under a pooled OLS model specification including GDP and the rest of the

³²It is important to highlight that the t -values and, consequently, the level of significance associated with each coefficient presented in Table 10 and Table 11 are identical to those obtained when the models are estimated using the standardized form of the variables instead of their original forms. Consider, for an example, the t -value associated with sample N1035 and Model (1) from Table 10: $-1.929/0.373 = 5.17$. This value is identical to the t -value associated with sample N1035 and Model (1) from Table 4: $-0.177/0.0342 = 5.17$.

controls. Column (2) presents the results under a year fixed effects model specification including GDP and the rest of the controls. Column (3) presents the results under a country fixed effects model specification including GDP and the rest of the controls. Column (4) presents the results under a year and country fixed effects model specification including GDP and the rest of the controls. Column (5) through (8) present the results under model specifications analogous to those in Column (1) through (4), respectively, but without GDP.

For an example of how to interpret Table 10 consider the result presented in Column (5) and row N234: -4.193. This number is the coefficient of the EFW index under a pooled OLS model specification without fixed effects, without GDP, with the rest of economic controls, and under sample N234. This result indicates that an increase of one unit in the Economic Freedom of the World index is associated with a decrease of 4.193 units in private lending rates. Furthermore, this result is significant to at least the 1 percent level, since the magnitude of the associated *t*-value is greater than 2.575.

This table illustrates the robustness and significance of the connection between the Economic Freedom of the World index and private lending rates. Of the 48 alternative model specifications presented in this table, all of the coefficients remain negative and with an average magnitude of 2.645. Moreover, the level of significance is at least 1 percent for the majority of the specifications. In other words, on average, a one unit increase in the Economic Freedom of the World index is associated with a decrease in private lending rates of 2.645 percentage points.

Table 11 presents the magnitude and the standard error (in parentheses) of the

coefficient for the Worldwide Governance Indicator index throughout the eight model specifications and the six sub-samples considered in this study. Column (1) presents the results under a pooled OLS model specification including GDP and the rest of the controls. Column (2) presents the results under a year fixed effects model specification including GDP and the rest of the controls. Column (3) presents the results under a country fixed effects model specification including GDP and the rest of the controls. Column (4) presents the results under a year and country fixed effects model specification including GDP and the rest of the controls. Column (5) through (8) present the results under model specifications analogous to those in Column (1) through (4), respectively, but without GDP.

For an example of how to interpret Table 11 consider the result presented in Column (3) and row N1506: -5.445. This number is the coefficient of the value of the WGI index under a country fixed effects model specification, with GDP, with the rest of economic controls, and under the sample N1506. This result indicates that an increase of one unit in the Worldwide Governance Indicators index is associated with a decrease of 5.445 units in private lending rates. Furthermore, this result is significant to at least the 1 percent level, since the magnitude of the associated t -value is greater than 2.575.

This table illustrates the robustness and significance of the connection between the Worldwide Governance Indicators index and private lending rates. Of the 48 alternative model specifications presented in this table, all of the coefficients remain negative and with an average magnitude of 4.2. Moreover, the level of significance is at least 1 percent

for the majority of the specifications.³³ In other words, on average, a one unit increase in the Worldwide Governance Indicators index is associated with a decrease in private lending rates of 4.2 percentage points.³⁴

³³The only coefficients not exhibiting a 1 percent level of significance are those corresponding to sample N234. This happens because sample N234 is derived following a very constricting set of restrictions based on the EFW dataset; hence, the size of this sample is very limited, and it does not contain enough variation in the WGI dataset to be able to significantly identify the model. Please refer to Chapter 5 for more information on sample N234.

³⁴It is worth recalling that the range of both the EFW index and the WGI index is different. In fact, the range of the EFW index is roughly twice as large as the range of the WGI index.

Table 10: Summary of Results using the Economic Freedom of the World Index

Dataset	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>N2002</i>	-5.243*** (0.615)	-4.984*** (0.626)	-4.181*** (1.066)	-2.912** (1.178)	-5.585*** (0.515)	-5.420*** (0.524)	-4.234*** (1.051)	-2.819** (1.158)
<i>N1035</i>	-1.929*** (0.373)	-1.685*** (0.377)	-2.632*** (0.525)	-1.073* (0.564)	-3.269*** (0.320)	-3.119*** (0.324)	-2.722*** (0.523)	-1.225** (0.562)
<i>N1006</i>	-1.252*** (0.365)	-1.019*** (0.369)	-2.698*** (0.494)	-1.102** (0.528)	-2.728*** (0.315)	-2.581*** (0.318)	-2.777*** (0.491)	-1.270** (0.526)
<i>N234</i>	-2.204** (1.116)	-2.047* (1.135)	-3.413*** (0.860)	-1.957** (0.875)	-4.193*** (0.818)	-4.038*** (0.834)	-3.514*** (0.852)	-2.235** (0.880)
<i>N1509</i>	-1.907*** (0.372)	-1.664*** (0.376)	-2.599*** (0.522)	-1.050* (0.560)	-3.247*** (0.319)	-3.097*** (0.323)	-2.689*** (0.519)	-1.200** (0.558)
<i>N1506</i>	-1.905*** (0.372)	-1.661*** (0.377)	-2.599*** (0.522)	-1.050* (0.560)	-3.241*** (0.320)	-3.085*** (0.323)	-2.689*** (0.519)	-1.200** (0.558)
GDP	YES	YES	YES	YES	NO	NO	NO	NO
Year FE	NO	YES	NO	YES	NO	YES	NO	YES
Country FE	NO	NO	YES	YES	NO	NO	YES	YES

Notes: The column titled “dataset” indicates the sample used. The columns titled (1) through (8) indicate the eight parallel models run for each sample size. The last three rows indicate the special characteristics of each model. The main values presented in the table are the coefficient of the Economic Freedom of the World index for each one of the model specifications indicated by its respective row and column. The smaller values in parentheses are the standard errors associated with the coefficients immediately above. The stars indicate the level of statistical significance following the standard convention of *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$.

Table 11: Summary of Results using the Worldwide Governance Indicators Index

Dataset	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>N2002</i>	-2.735*** (0.577)	-2.791*** (0.576)	-6.135*** (1.600)	-5.800*** (1.589)	-4.182*** (0.392)	-4.189*** (0.391)	-6.336*** (1.593)	-5.871*** (1.581)
<i>N1035</i>	-2.720*** (0.497)	-2.783*** (0.494)	-8.360*** (1.289)	-8.887*** (1.231)	-3.827*** (0.316)	-3.847*** (0.314)	-8.502*** (1.288)	-8.611*** (1.234)
<i>N1006</i>	-2.233*** (0.484)	-2.281*** (0.481)	-8.594*** (1.209)	-9.143*** (1.144)	-3.520*** (0.306)	-3.522*** (0.305)	-8.721*** (1.208)	-8.839*** (1.149)
<i>N234</i>	1.138 (1.454)	0.823 (1.483)	-0.270 (2.064)	-0.253 (1.881)	-3.244*** (0.806)	-3.248*** (0.814)	-0.377 (2.067)	0.067 (1.909)
<i>N1509</i>	-1.782*** (0.368)	-1.826*** (0.366)	-5.445*** (0.913)	-5.109*** (0.884)	-3.559*** (0.252)	-3.565*** (0.251)	-5.520*** (0.914)	-5.093*** (0.884)
<i>N1506</i>	-1.782*** (0.369)	-1.822*** (0.367)	-5.445*** (0.913)	-5.109*** (0.884)	-3.560*** (0.253)	-3.560*** (0.252)	-5.520*** (0.914)	-5.093*** (0.884)
GDP	YES	YES	YES	YES	NO	NO	NO	NO
Year FE	NO	YES	NO	YES	NO	YES	NO	YES
Country FE	NO	NO	YES	YES	NO	NO	YES	YES

Notes: The column titled “dataset” indicates the sample used. The columns titled (1) through (8) indicate the eight parallel models run for each sample size. The last three rows indicate the special characteristics of each model. The main values presented in the table are the coefficient of the Worldwide Governance Indicator index for each one of the model specifications indicated by its respective row and column. The smaller values in parentheses are the standard errors associated with the coefficients immediately above. The stars indicate the level of statistical significance following the standard convention of *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$.

CONCLUSION

During the last few decades, the theoretical literature highlighting the importance of institutional frameworks on economic and financial performance has exhibited much growth. Furthermore, the collection of more reliable institutional panel data has supported a growing body of empirical research examining several of these theoretical claims.

This thesis expands on the literature by offering the first empirical study on the relationship between institutional development and private credit riskiness around the world. This paper develops a comprehensive empirical analysis of this relationship by using a large panel data-set on lending rates, institutions, and several common economic controls. The results obtained suggest that, on average, a higher level of institutional development is associated with interest rate reductions that may, in turn, be due to lower levels of credit riskiness. Moreover, these results appear to be very robust to a wide array of sensitivity tests to issues like: sensitivity to estimation procedures, sensitivity to sample selection, sensitivity to variable selection, and sensitivity to aggregation methods.

These results are in line with expectations based on economic theory, and are consistent with similar existing empirical studies examining the relationship between institutions and several other indicators of country-level economic and financial performance. Moreover, this thesis finds that the negative relationship between institutions and private lending rates is not only highly statistically significant, but also exhibits a substantial level of economic significance. A country in the 90th percentile of the Economic Freedom of the World index is found to present interest rates that are roughly

four percentage points lower than a country in the 10th percentile of the index, after controlling for several relevant macroeconomic variables.³⁵ This effect is comparable to that of inflation, which is widely recognized as one of the main determinants of interest rates around the world.

Lastly, the attempt to disaggregate the effect of institutional variables was unsuccessful due to several econometric issues stemming from the strong interconnectedness of the data on institutions. This is in line with the theoretical suggestion that institutional development generally occurs and impacts national macroeconomies as a bundle rather than independently.

A few important issues remain to be addressed by future research: (1) devising a statistically and economically sound way of dealing with the disaggregation of the economic freedom indexes; (2) examining more complex core model specifications including elements such as nonlinear and interaction effects; (3) exploring additional measures of economic freedom such as the one presented by the Heritage Foundation and Freedom House; and (4) studying time-series issues such as stationarity as more data-points become available. Furthermore, the longer term influences of institutions on interest rates need to be investigated; these influences may be even higher than the contemporaneous effects studied in this paper.

³⁵This result is computed by evaluating the formula $|P_{90} - P_{10}|$, for $P_i = \overline{intrate} + \beta * EFW (\overline{EFW} - EFW_i)$, where $\overline{intrate}$ and $\overline{EFW}$ represent the respective sample averages, β represents the coefficient associated with EFW , and EFW_i represents the sample i th percentile threshold value for EFW . Using the base sample (N1035) and the core model specification (pooled OLS estimation) for an example, $|P_{90} - P_{10}| = 4.051$.

REFERENCES CITED

- Daron Acemoglu, Simon Johnson, and James A Robinson. The colonial origins of comparative development: an empirical investigation. Technical report, National bureau of economic research, 2000.
- Daron Acemoglu, James A Robinson, and Dan Woren. *Why nations fail: the origins of power, prosperity, and poverty*, volume 4. SciELO Chile, 2012.
- Philippe Aghion and Patrick Bolton. An incomplete contracts approach to financial contracting. *The review of economic Studies*, 59(3):473–494, 1992.
- Fahim Al-Marhubi. The determinants of governance: A cross-country analysis. *Contemporary Economic Policy*, 22(3):394–406, 2004.
- Armen A Alchian and Harold Demsetz. Production, information costs, and economic organization. *The American economic review*, pages 777–795, 1972.
- Alberto Alesina and Roberto Perotti. Income distribution, political instability, and investment. *European Economic Review*, 40(6):1203–1228, 1996.
- Christiane Arndt and Charles Oman. *Development Centre Studies Uses and Abuses of Governance Indicators*. OECD Publishing, 2006.
- Janine Aron. Growth and institutions: a review of the evidence. *The World Bank Research Observer*, 15(1):99–135, 2000.
- Ernest Aryeetey. Private investment under uncertainty in ghana. *World Development*, 22(8):1211–1221, 1994.
- Elizabeth Asiedu and Donald Lien. Democracy, foreign direct investment and natural resources. *Journal of International Economics*, 84(1):99–111, 2011.
- Kee-Hong Bae and Vidhan K Goyal. Property rights protection and bank loan pricing. 2003.
- World Bank. World bank releases largest available governance data source. *Washington DC: World Bank.*, 2006.
- Robert J Barro. Economic growth in a cross section of countries. *The quarterly journal of economics*, 106(2):407–443, 1991.
- Andrea Beltratti and René M Stulz. Why did some banks perform better during the credit crisis? a cross-country study of the impact of governance and regulation. Technical report, National Bureau of Economic Research, 2009.
- Niclas Berggren. The benefits of economic freedom. *Independent Review*, 8(2):193–211, 2003.

- Timothy Besley. Property rights and investment incentives: Theory and evidence from ghana. *journal of Political Economy*, pages 903–937, 1995.
- Christian Bjornskov. The multiple facets of social capital. *European journal of political economy*, 22(1):22–40, 2006.
- Mario I Blejer and Mohsin S Khan. Government policy and private investment in developing countries (politique des pouvoirs publics et investissement privé dans les pays en développement)(política estatal e inversión privada en los países en desarrollo). *Staff Papers-International Monetary Fund*, pages 379–403, 1984.
- John Bound, David A Jaeger, and Regina M Baker. Problems with instrumental variables estimation when the correlation between the instruments and the endogenous explanatory variable is weak. *Journal of the American statistical association*, 90(430): 443–450, 1995.
- John H Boyd, Ross Levine, and Bruce D Smith. The impact of inflation on financial sector performance. *Journal of Monetary Economics*, 47(2):221–248, 2001.
- Gene A Brewer, Yujin Choi, and Richard M Walker. Accountability, corruption and government effectiveness in asia: An exploration of world bank governance indicators. *International Public Management Review*, 8(2):200–217, 2007.
- Thomas L Brewer and Pietra Rivoli. Politics and perceived country creditworthiness in international banking. *Journal of Money, Credit and Banking*, 22(3):357–369, 1990.
- Aymo Brunetti and Beatrice Weder. Investment and institutional uncertainty: a comparative study of different uncertainty measures. *Weltwirtschaftliches Archiv*, 134 (3):513–533, 1998.
- Matthias Busse. Democracy and fdi. Technical report, HWWA discussion paper, 2003.
- Matthias Busse and Carsten Hefeker. Political risk, institutions and foreign direct investment. *European journal of political economy*, 23(2):397–415, 2007.
- Alexander W Butler and Larry Fauver. Institutional environment and sovereign credit ratings. *Financial Management*, 35(3):53–79, 2006.
- Edgardo Campos, Donald Lien, and Sanjay Pradhan. The impact of corruption on investment: Predictability matters. *World development*, 27(6):1059–1067, 1999.
- C Candace, Glen Biglaiser Archer, and Karl DeRouen Jr. Sovereign bonds and the "democratic advantage": Does regime type affect credit rating agency ratings in the developing world? *International Organization*, 61:341–365, 2007.
- Richard Cantor and Frank Packer. Determinants and impact of sovereign credit ratings. *Economic Policy Review*, 2(2), 1996.

- Christopher Clague, Philip Keefer, Stephen Knack, and Mancur Olson. Contract-intensive money: contract enforcement, property rights, and economic performance. *Journal of Economic Growth*, 4(2):185–211, 1999.
- Ronald H Coase. The nature of the firm. *economica*, 4(16):386–405, 1937.
- Ronald Harry Coase. Problem of social cost, the. *Jl & econ.*, 3:1, 1960.
- John T Cuddington. Macroeconomic determinants of capital flight: an econometric investigation. *Capital Flight and Third World Debt. Washington, DC: Institute for International Economics*, pages 85–96, 1987.
- John W Dawson. Institutions, investment, and growth: New cross-country and panel data evidence. *Economic Inquiry*, 36(4):603–619, 1998.
- Jakob De Haan and Jan-Egbert Sturm. On the relationship between economic freedom and economic growth. *European Journal of Political Economy*, 16(2):215–241, 2000.
- Jakob De Haan, Susanna Lundström, and Jan-Egbert Sturm. Market-oriented institutions and policies and economic growth: A critical survey. *Journal of Economic Surveys*, 20(2):157–191, 2006.
- Hernando De Soto et al. *Mystery of capital: why capitalism triumphs in the West and fails everywhere else*. Basic books, 2003.
- Ash Demircug-Kunt and Harry Huizinga. Determinants of commercial bank interest margins and profitability: Some international evidence. *The World Bank Economic Review*, 13(2):379–408, 1999.
- Asli Demircug-Kunt, Luc Laeven, and Ross Levine. Regulations, market structure, institutions, and the cost of financial intermediation. Technical report, National Bureau of Economic Research, 2003.
- Simeon Djankov, Caralee McLiesh, and Andrei Shleifer. Private credit in 129 countries. *Journal of financial Economics*, 84(2):299–329, 2007.
- Chris Doucouliagos. Publication bias in the economic freedom and economic growth literature. *Journal of Economic Surveys*, 19(3):367–387, 2005.
- William Easterly. Evaluating aid performance of donors. *Center for Global Development, Washington DC*, 2002.
- Yi Feng. Political freedom, political instability, and policy uncertainty: A study of political institutions and private investment in developing countries. *International Studies Quarterly*, 45(2):271–294, 2001.
- Arturo Galindo. Creditor rights and the credit market: where do we stand? 2001.

- Raymond Duncan Gastil. Freedom in the world. *Freedom House, New York*, 1972.
- R Gaston Gelos. Banking spreads in latin america. *Economic Inquiry*, 47(4):796–814, 2009.
- Steven Globerman and Daniel Shapiro. Global foreign direct investment flows: the role of governance infrastructure. *World development*, 30(11):1899–1919, 2002.
- Hazel Gray. Governance for economic growth and poverty reduction: empirical evidence and new directions reviewed. 2007.
- Joshua Greene and Delano Villanueva. Private investment in developing countries: an empirical analysis. *IMF Staff Papers*, 38(1):33–58, 1991.
- William H Greene. Econometric analysis, 5th. Ed.. *Upper Saddle River, NJ*, 2003.
- World Bank Group. World development report 2002: building institutions for markets. *Washington: World Bank*, 2002.
- World Bank Group. *World Development Indicators 2012*. World Bank Publications, 2012.
- James Gwartney and Robert Lawson. Economic freedom of the world: 2002 annual report. *The Fraser Institute*, 2002.
- James Gwartney, Robert Lawson, and Walter Block. Economic freedom of the world. *The Fraser Institute*, 1996.
- James Gwartney, R Lawson, et al. Economic freedom of the world: 2001 annual report, the fraser institute, vancouver. *The Fraser Institute*, 2001.
- James Gwartney, Robert Lawson, and Seth Norton. *Economic freedom of the world 2008 annual report*. The Fraser Institute, 2008.
- James Gwartney, Joshua Hall, and Robert Lawson. Economic freedom of the world: 2013 annual report. *The Fraser Institute*, 2013.
- Joshua C Hall and Robert A Lawson. Economic freedom of the world: An accounting of the literature. *Contemporary Economic Policy*, 32(1):1–19, 2014.
- Mary Hallward-Driemeier, Gita Khun-Jush, and Lant Pritchett. Deals versus rules: policy implementation uncertainty and why firms hate it. Technical report, National Bureau of Economic Research, 2010.
- Jac C Heckelman and Michael D Stroup. A comparison of aggregation methods for measures of economic freedom. *European Journal of Political Economy*, 21(4): 953–966, 2005.
- Freedom House. Freedom in the world 2014 methodology. *Freedom House*, 2014.

- Elisabeth Huybens and Bruce D Smith. Inflation, financial markets and long-run real activity. *Journal of Monetary Economics*, 43(2):283–315, 1999.
- Jo Jakobsen and Indra De Soysa. Do foreign investors punish democracy? theory and empirics, 1984–2001. *Kyklos*, 59(3):383–410, 2006.
- Tullio Jappelli and Marco Pagano. Information sharing, lending and defaults: Cross-country evidence. *Journal of Banking & Finance*, 26(10):2017–2045, 2002.
- Tullio Jappelli, Marco Pagano, and Magda Bianco. Courts and banks: effects of judicial enforcement on credit markets. *Journal of Money, Credit and Banking*, pages 223–244, 2005.
- Frederick Z Jaspersen, Anthony Aylward, and Mariusz Sumlinski. Trends in private investment in developing countries. *International Finance Corporation Discussion Paper*, (28), 1995.
- Nathan M Jensen. Democratic governance and multinational corporations: Political regimes and inflows of foreign direct investment. *International Organization*, 57(3): 587–616, 2003.
- Bryan T Johnson, Thomas P Sheehy, et al. *The index of economic freedom*. Heritage Foundation Washington, DC, 1995.
- Stefan Karlsson. The failings of the economic freedom index. *Mises Institute*, 2005.
- Daniel Kaufmann and Aart Kraay. Growth without governance. *World Bank Policy Research Working Paper*, (2928), 2002.
- Daniel Kaufmann and Aart Kraay. Governance indicators: Where are we, where should we be going? *The World Bank Research Observer*, 23(1):1–30, 2008.
- Daniel Kaufmann, Aart Kraay, and Pablo Zoido-Lobaton. Governance matters. *World Bank, Development Research Group, Macroeconomics and Growth, and World Bank Institute, Governance, Regulation, and Finance*, 1999.
- Daniel Kaufmann, Aart Kraay, and Massimo Mastruzzi. Governance matters iii: Governance indicators for 1996, 1998, 2000, and 2002. *The World Bank Economic Review*, 18(2):253–287, 2004.
- Daniel Kaufmann, Aart Kraay, and Massimo Mastruzzi. *The worldwide governance indicators project: answering the critics*, volume 4149. World Bank Publications, 2007a.
- Daniel Kaufmann, Aart Kraay, and Massimo Mastruzzi. Growth and governance: A reply. *Journal of politics*, 69(2):555–562, 2007b.

- Daniel Kaufmann, Aart Kraay, and Massimo Mastruzzi. Governance matters vi: aggregate and individual governance indicators. *World Bank Policy Research Working Paper*, 4280, 2007c.
- Daniel Kaufmann, Aart Kraay, and Massimo Mastruzzi. Governance matters viii: Aggregate and individual governance indicators, 1996-2008. *World Bank Policy Research Working Paper No. 4978*, 2009.
- Daniel Kaufmann, Aart Kraay, and Massimo Mastruzzi. The worldwide governance indicators: methodology and analytical issues. *Hague Journal on the Rule of Law*, 3 (02):220–246, 2011.
- Philip Keefer and Stephen Knack. Institutions and economic performance: cross-country tests using alternative institutional measures. *Economics & Politics*, 7(3):207–227, 1995.
- Stephen Knack. Measuring corruption in eastern europe and central asia: a critique of the cross-country indicators. *World Bank Policy Research Working Paper*, (3968), 2006.
- Roger C Kormendi and Philip G Meguire. Macroeconomic determinants of growth: cross-country evidence. *Journal of Monetary economics*, 16(2):141–163, 1985.
- Irving B Kravis, Alan W Heston, and Robert Summers. Real gdp per capita for more than one hundred countries. *The Economic Journal*, pages 215–242, 1978.
- Marcus J Kurtz and Andrew Schrank. Growth and governance: Models, measures, and mechanisms. *Journal of politics*, 69(2):538–554, 2007a.
- Marcus J Kurtz and Andrew Schrank. Growth and governance: A defense. *Journal of politics*, 69(2):563–569, 2007b.
- Simon Kuznets. National income, 1919-1935. In *National Income, 1919-1935*. NBER, 1937.
- Rafael La Porta, Florencio Lopez-de Silanes, Andrei Shleifer, and Robert W Vishny. Legal determinants of external finance. 1997.
- Rafael La Porta, Florencio Lopez-de Silanes, Andrei Shleifer, and Robert Vishny. Law and finance. *Journal of political economy*, 106:1113–1155, 1998.
- Luc Laeven and Giovanni Majnoni. Does judicial efficiency lower the cost of credit? *Journal of Banking & Finance*, 29(7):1791–1812, 2005.
- Laura Langbein and Stephen Knack. The worldwide governance indicators: six, one, or none? *The Journal of Development Studies*, 46(2):350–370, 2010.
- Robert A Lawson. On testing the connection between economic freedom and growth. *Econ Journal Watch*, 3(3):398–406, 2006.

- Quan V Le. Political and economic determinants of private investment. *Journal of International Development*, 16(4):589–604, 2004.
- Edward E Leamer. Let's take the con out of econometrics. *The American Economic Review*, 73, 1983. URL <http://links.jstor.org/sici?sici=0002-8282%28198303%2973%3A16703C31%3ALTTC00%3E2.0.006703B2-R>.
- Edward E Leamer. Sensitivity analyses would help. *American Economic Review*, 75(3): 308–13, 1985.
- Ross Levine. The legal environment, banks, and long-run economic growth. *Journal of Money, Credit & Banking (Ohio State University Press)*, 30(3), 1998.
- Ross Levine. Law, finance, and economic growth. *Journal of financial Intermediation*, 8 (1):8–35, 1999.
- Ross Levine and David Renelt. A sensitivity analysis of cross-country growth regressions. *American economic review*, 82(4):942–963, 1992.
- Quan Li. Democracy, autocracy, and expropriation of foreign direct investment. *Comparative Political Studies*, 2009.
- Quan Li and Adam Resnick. Reversal of fortunes: Democratic institutions and foreign direct investment inflows to developing countries. *International organization*, 57(1): 175–212, 2003.
- Scott Mainwaring, Daniel Brinks, and Aníbal Pérez-Liñán. Classifying political regimes in latin. *Studies in Comparative International Development*, 36(1):37–65, 2001.
- Paolo Mauro. Corruption and growth. *The quarterly journal of economics*, pages 681–712, 1995.
- Pierre-Guillaume Méon and Khalid Sekkat. Does corruption grease or sand the wheels of growth? *Public choice*, 122(1-2):69–97, 2005.
- Terry Miller, Anthony B Kim, and Kim R Holmes. 2014 index of economic freedom. *The Heritage Foundation*, 2014.
- Tormod Naes and Bjorn-Helge Mevik. Understanding the collinearity problem in regression and discriminant analysis. *Journal of Chemometrics*, 15(4):413–426, 2001.
- Douglass C North. Institutions, transaction costs and economic growth. *Economic Inquiry*, 25(3):419–428, 1987.
- Douglass C North. Institutions and economic growth: an historical introduction. *World development*, 17(9):1319–1332, 1989.

- Douglass C North. *Institutions, institutional change and economic performance*. Cambridge university press, 1990.
- Douglass C North. The new institutional economics and development. *EconWPA Economic History*, 9309002, 1993.
- Mancur Olson. Dictatorship, democracy, and development. *American Political Science Review*, 87(03):567–576, 1993.
- Sule Ozler. The evolution of credit terms: An empirical study of commercial bank lending to developing countries. *Journal of Development Economics*, 38(1):79–97, 1992.
- Sule Ozler and Dani Rodrik. External shocks, politics and private investment: Some theory and empirical evidence. *Journal of Development Economics*, 39(1):141–162, 1992.
- Manuel Pastor Jr and Eric Hilt. Private investment and democracy in latin america. *World Development*, 21(4):489–507, 1993.
- Manuel Pastor Jr and Jae Ho Sung. Private investment and democracy in the developing world. *Journal of Economic Issues*, pages 223–243, 1995.
- Ben Patterson and Kristina Lygnerud. The determination of interest rates. *European Parliament: Economic Affairs Series*, 1999.
- Robert S Pindyck and Daniel L Rubinfeld. *Econometric models and economic forecasts*, volume 4. Irwin/McGraw-Hill Boston, 1998.
- Adam Przeworski. Freedom to choose and democracy. *Economics and Philosophy*, 19(02):265–279, 2003.
- Adam Przeworski and Fernando Limongi. Political regimes and economic growth. *The journal of economic perspectives*, pages 51–69, 1993.
- Arch Puddington. Freedom in the world 2014. *Freedom House*, pages 29–04, 2014.
- Dani Rodrik. Policy uncertainty and private investment in developing countries. *Journal of Development Economics*, 36(2):229–242, 1991.
- Saurav Roychoudhury and Robert A Lawson. Economic freedom and sovereign credit ratings and default risk. *Journal of Financial Economic Policy*, 2(2):149–162, 2010.
- Sebastian M Saiegh. Do countries have a "democratic advantage"? political institutions, multilateral agencies, and sovereign borrowing. *Comparative Political Studies*, 38(4): 366–387, 2005.
- Anthony Saunders and Liliana Schumacher. The determinants of bank interest rate margins: an international study. *Journal of international Money and Finance*, 19(6): 813–832, 2000.

- Friedrich Schneider and Bruno S Frey. Economic and political determinants of foreign direct investment. *World development*, 13(2):161–175, 1985.
- Luis Servén. Irreversibility, uncertainty and private investment: Analytical issues and some lessons for africa. *Journal of African Economies*, 6(3):229–68, 1997.
- Luis Servén and Andres Solimano. Private investment and macroeconomic adjustment: a survey. *The World Bank Research Observer*, 7(1):95–114, 1992.
- Beata Smarzynska. The composition of foreign direct investment and protection of intellectual property rights: Evidence from transition economies. *European economic review*, 48(1):39–62, 2004.
- Joseph E Stiglitz and Andrew Weiss. Credit rationing in markets with imperfect information. *The American economic review*, pages 393–410, 1981.
- Jan-Egbert Sturm, Erik Leertouwer, and Jakob de Haan. Which economic freedoms contribute to growth? a comment. *Kyklos*, 55(3):403–416, 2002.
- Jakob Svensson. Investment, property rights and political instability: Theory and evidence. *European Economic Review*, 42(7):1317–1341, 1998.
- Melissa A Thomas. What do the worldwide governance indicators measure? *European Journal of Development Research*, 22(1):31–54, 2010.
- Paul M Vaaler, Burkhard N Schrage, and Steven A Block. Counting the investor vote: Political business cycle effects on sovereign bond spreads in developing countries. *Journal of International Business Studies*, 36(1):62–88, 2005.
- Stefan Voigt. How (not) to measure institutions. *Journal of Institutional Economics*, 9(01):1–26, 2013.
- U Tun Wai and Chorng-huey Wong. Determinants of private investment in developing countries. *The Journal of Development Studies*, 19(1):19–36, 1982.
- Oliver E Williamson. The new institutional economics: taking stock, looking ahead. *Journal of economic literature*, pages 595–613, 2000.
- Jeffrey Wooldridge. *Introductory econometrics: A modern approach*. Cengage Learning, 2012.

APPENDICES

APPENDIX A

MULTICOLLINEARITY

This appendix summarizes the relevant condition numbers obtained for each of the samples considered in this study, and presents them in Table 12. The first column in this table defines the sample for which results are presented in each row. The second column presents the condition number of the X matrix composed by the EFW areas and control variables as its columns. The third column presents the condition number of the X matrix composed by the EFW components and control variables as its columns. Lastly, the fourth column presents the condition number of the X matrix composed by the WGI areas and control variables as its columns.

The condition number of the matrix X is defined in this study as the ratio between the highest and lowest singular values of the matrix X . These singular values are obtained by applying a singular value decomposition procedure to the matrix X . As a general rule of thumb, condition numbers above one hundred are reason for multicollinearity concerns, which in turn imply near-singularity of the $X'X$ matrix. This near-singularity causes the estimation procedure to become highly sensitive, thereby making the inferences unreliable.

The consistently high condition numbers presented in Table 12 represent statistical evidence that separately including individual areas of the institutional indexes into the model would generate multicollinearity issues.

Table 12: Condition Numbers

Sample	Condition number		
	EFW Areas	EFW Components	WGI Areas
N2002	273	655	101
N1035	289	841	117
N1006	290	839	115
N234	355	1974	133
N1509	289	841	91
N1506	288	841	91

APPENDIX B

SAMPLE SENSITIVITY

Consider the simple linear regression model

$$y_i = \alpha_0 + \alpha_1 x_i + \alpha_2 D_i + \varepsilon_i,$$

where x is the independent variable of interest, and D is an indicator variable defined as

$$D_i = \begin{cases} 1, & \text{whenever } x_i \text{ is equal to some constant value } c, \\ 0, & \text{otherwise.} \end{cases}$$

Let all observations of the independent variable x be sorted such that

$$x_{(i)} \neq c \quad \text{for } i = 1, 2, \dots, k; \text{ and}$$

$$x_{(i)} = c \quad \text{for } i = k + 1, k + 2, \dots, n.$$

Then, without loss of generality, let the $n \times 1$ vector of independent variables x be

re-defined as

$$\mathbf{x} \equiv \begin{bmatrix} x_{(1)} \\ x_{(2)} \\ \vdots \\ x_{(k)} \\ x_{(k+1)} \\ \vdots \\ x_{(n)} \end{bmatrix} \equiv \begin{bmatrix} \mathbf{x}_v \\ \mathbf{x}_c \end{bmatrix},$$

where, $\mathbf{x}_v$ denotes the $k \times 1$ vector of all $x_i \neq c$, while $\mathbf{x}_c$ denotes the $(n - k) \times 1$ vector of all $x_i = c$.

Subsequently, the $n \times 1$ vector of all values of D can be respectively re-defined as

$$\mathbf{D} \equiv \begin{bmatrix} \mathbf{D}_v \\ \mathbf{D}_c \end{bmatrix} = \begin{bmatrix} \mathbf{0}^{[k \times 1]} \\ \mathbf{1}^{[(n-k) \times 1]} \end{bmatrix};$$

in other words,

$$D_i \equiv \begin{cases} D_v = 0, & \text{for } i = 1, 2, \dots, k; \text{ and} \\ D_c = 1, & \text{for } i = k + 1, k + 2, \dots, n. \end{cases}$$

Lastly, the $n \times 1$ vector of dependent variable observations can be re-defined respectively as

$$\mathbf{y} \equiv \begin{bmatrix} \mathbf{y}_v \\ \mathbf{y}_c \end{bmatrix}.$$

Hence, the sum of squared residuals equation can be expressed as

$$\begin{aligned}
 S &= \sum_{i=1}^n e_i^2 \\
 &= \sum_{i=1}^k e_i^2 + \sum_{i=k+1}^n e_i^2 \\
 &= \sum_{i=1}^k (y_i - \alpha_0 - \alpha_1 x_i - \alpha_2 D_v)^2 + \sum_{i=k+1}^n (y_i - \alpha_0 - \alpha_1 x_i - \alpha_2 D_c)^2 \\
 &= \sum_{i=1}^k (y_i - \alpha_0 - \alpha_1 x_i)^2 + \sum_{i=k+1}^n (y_i - \alpha_0 - \alpha_1 c - \alpha_2)^2.
 \end{aligned}$$

Hence,

$$\frac{\partial S}{\partial \alpha_2} = 2 \sum_{i=k+1}^n (y_i - \alpha_0 - \alpha_1 c - \alpha_2) (-1).$$

Thus, S reaches a critical point whenever

$$\sum_{i=k+1}^n (y_i - \alpha_0 - \alpha_1 c - \alpha_2) = 0,$$

In other words, S reaches a critical point whenever

$$\alpha_2 = \bar{y}_c - \alpha_0 - \alpha_1 c, \tag{11}$$

where $\bar{y}_c$ is the mean of $\mathbf{y}_c$.

Similarly, it follows that

$$\frac{\partial S}{\partial \alpha_0} = 2 \sum_{i=1}^k (y_i - \alpha_0 - \alpha_1 x_i) (-1) + 2 \sum_{i=k+1}^n (y_i - \alpha_0 - \alpha_1 c - \alpha_2) (-1).$$

Making use of Equation (11), it can be concluded that S reaches a critical point whenever

$$\begin{aligned} 0 &= \sum_{i=1}^k (y_i - \alpha_0 - \alpha_1 x_i) + \sum_{i=k+1}^n [y_i - \alpha_0 - \alpha_1 c - (\bar{y}_c - \alpha_0 - \alpha_1 c)] \\ &= \sum_{i=1}^k (y_i - \alpha_0 - \alpha_1 x_i) + \sum_{i=k+1}^n (y_i - \bar{y}_c) \\ &= \bar{y}_v - \alpha_0 - \alpha_1 \bar{x}_v. \end{aligned}$$

where $\bar{y}_v$ is the mean of y_v . That is, S reaches a critical point whenever

$$\alpha_0 = \bar{y}_v - \alpha_1 \bar{x}_v. \quad (12)$$

Lastly, note that

$$\frac{\partial S}{\partial \alpha_1} = 2 \sum_{i=1}^k (y_i - \alpha_0 - \alpha_1 x_i) (-x_i) + 2 \sum_{i=k+1}^n (y_i - \alpha_0 - \alpha_1 c - \alpha_2) (-c).$$

Then, using Equations (11) and (12), it may be derived that

$$\begin{aligned}
 0 &= \sum_{i=1}^k (y_i - \alpha_0 - \alpha_1 x_i) (x_i) \\
 &= \sum_{i=1}^k [y_i - (\bar{y}_v - \alpha_1 \bar{x}_v) - \alpha_1 x_i] (x_i) \\
 &= \sum_{i=1}^k (y_i - \bar{y}_v) (x_i) - \alpha_1 \sum_{i=1}^k (x_i - \bar{x}_v) (x_i) \\
 &= \sum_{i=1}^k (y_i x_i - \bar{y}_v x_i) - \alpha_1 \sum_{i=1}^k (x_i^2 - \bar{x}_v x_i) \\
 &= \sum_{i=1}^k (y_i x_i - \bar{y}_v x_i) - \alpha_1 \sum_{i=1}^k (x_i^2 - \bar{x}_v x_i). \tag{13}
 \end{aligned}$$

Note that

$$\begin{aligned}
 \sum_{i=1}^k (x_i - \bar{x}_v)^2 &= \sum_{i=1}^k (x_i^2 - 2x_i \bar{x}_v + \bar{x}_v^2) \\
 &= \sum_{i=1}^k x_i^2 - \bar{x}_v \sum_{i=1}^k (2x_i - \bar{x}_v) \\
 &= \sum_{i=1}^k x_i^2 - \bar{x}_v \left(2 \sum_{i=1}^k x_i - \sum_{i=1}^k x_i \right) \\
 &= \sum_{i=1}^k (x_i^2 - \bar{x}_v x_i). \tag{14}
 \end{aligned}$$

Therefore, by Equations (13) and (14),

$$\alpha_1 = \frac{\sum_{i=1}^k y_i (x_i - \bar{x}_v)}{\sum_{i=1}^k (x_i - \bar{x}_v)^2}.$$

In other words, neither the intercept nor the slope coefficients are affected by those

observations where $x_i = c$. That is, the OLS slope estimator is determined exclusively by those observations that present variation.

Now, consider the standard error of α_1 . First, let the following notational abbreviation be defined:

$$S_{XY} \equiv \sum (X_i - \bar{X})(Y_i - \bar{Y}), \text{ for any pair of variables } X \text{ and } Y.$$

Then, the sample variance of α_1 can be expressed as

$$s_{\alpha_1}^2 = \frac{s_e^2}{S_{xx}(1 - r_{xD}^2)}. \quad (15)$$

Recall that s_e^2 is an estimator for the standard deviation of the error term ε . Then, assuming the same structural relation between y and all x 's, irrespective of variation, $E[s_e^2] = \sigma^2$ irrespective of sample. Therefore, the attention may be focused on how the different samples affect the denominator in Equation 15. First, consider

$$r_{xD} = \frac{S_{xD}}{\sqrt{S_{xx}S_{DD}}}. \quad (16)$$

Begin by noting that

$$\bar{D} = \frac{\sum_{i=1}^n D_i}{n} = \frac{n - k}{n}.$$

Hence,

$$\begin{aligned}
 S_{DD} &= \sum_{i=1}^k (D_i - \bar{D})^2 + \sum_{i=k+1}^n (D_i - \bar{D})^2 \\
 &= \sum_{i=1}^k (-\bar{D})^2 + \sum_{i=k+1}^n (1 - \bar{D})^2 \\
 &= n - k - (n - k) 2\bar{D} + n\bar{D}^2 \\
 &= \frac{k(n - k)}{n}.
 \end{aligned}$$

Now, consider

$$\begin{aligned}
 S_{xD} &= \sum_{i=1}^k (x_i - \bar{x})(D_i - \bar{D}) + \sum_{i=k+1}^n (x_i - \bar{x})(D_i - \bar{D}) \\
 &= \bar{D} \left(k\bar{x} - \sum_{i=1}^k x_i \right) + (n - k)(c - \bar{x})(1 - \bar{D}) \\
 &= k\bar{D}(\bar{x} - \bar{x}_v) + (n - k)(c - \bar{x})(1 - \bar{D}) \\
 &= S_{DD}(c - \bar{x}_v).
 \end{aligned} \tag{17}$$

Therefore, by Equations 16 and 17, it may be concluded that

$$r_{xD} = \frac{\sqrt{S_{DD}}(c - \bar{x}_v)}{\sqrt{S_{xx}}}.$$

Lastly, consider S_{xx} . First, let

$$x_{v_i} = x_i - \bar{x}_v; \text{ and}$$

$$\Delta = c - \bar{x}_v.$$

Also, note that

$$\begin{aligned}\bar{x}_v - \bar{x} &= \bar{x}_v - \left(\frac{k}{n} \bar{x}_v + \frac{n-k}{n} c \right) \\ &= \frac{n-k}{n} (-\Delta); \end{aligned}$$

and

$$\begin{aligned}c - \bar{x} &= c - \left(\frac{k}{n} \bar{x}_v + \frac{n-k}{n} c \right) \\ &= \frac{k}{n} \Delta. \end{aligned}$$

Then, it can be derived that

$$\begin{aligned}S_{xx} &= \sum_{i=1}^k (x_i - \bar{x})^2 + \sum_{i=k+1}^n (x_i - \bar{x})^2 \\ &= \sum_{i=1}^k (x_{v_i} + \bar{x}_v - \bar{x})^2 + (n-k) (c - \bar{x})^2 \\ &= \sum_{i=1}^k \left[x_{v_i} + \frac{n-k}{n} (-\Delta) \right]^2 + (n-k) \left(\frac{k}{n} \right)^2 \Delta^2 \\ &= \sum_{i=1}^k x_{v_i}^2 - 2 \frac{n-k}{n} \Delta \sum_{i=1}^k x_{v_i} + k \left(\frac{n-k}{n} \right)^2 \Delta^2 + (n-k) \left(\frac{k}{n} \right)^2 \Delta^2 \\ &= S_{x_v x_v} + \frac{k(n-k)}{n} \Delta^2 \left(\frac{n-k}{n} + \frac{k}{n} \right) \\ &= S_{x_v x_v} + S_{DD} \Delta^2. \end{aligned}$$

Therefore, the denominator in Equation 15 can be expressed as

$$\begin{aligned} S_{xx}(1 - r_{xD}^2) &= (S_{x_v x_v} + S_{DD}\Delta^2) \left(1 - \frac{S_{DD}\Delta^2}{S_{x_v x_v} + S_{DD}\Delta^2} \right) \\ &= S_{x_v x_v}. \end{aligned}$$

This implies that all the difference between the standard error of the coefficient of x in this two models will be driven by the numerator term s_e^2 . Assuming the same underlying structural relationship between x and y for all x 's, s_e^2 should remain unchanged between the two models, on average. Empirically, however, one is likely to find that s_e^2 will differ between these two models, thereby affecting the standard error of the coefficient in question. Given the nature of the data presented in this study, it has been deemed prudent to test the robustness of the results under the two alternative scenarios explored in this appendix.

These results are applied to this paper by the use of samples N1006, N234, and N1506. Lastly, it is to be noticed that the dummy variable indicating variation, denoted by D in the proof above, takes the form of country-level dummies in the model specifications of this paper.

APPENDIX C

ADDITIONAL SUMMARY STATISTICS

This appendix presents some additional summary statistics not displayed in the main body of this paper. First, a table listing the countries contained in each one of the three most distinct samples used in the analysis of this study is presented. Second, summary statistics for each of the samples used in the analysis of this paper are presented. Third a set of three figures is presented conveying the cross-sectional nature of the data under the base sample.

First, a table listing the countries contained in each one of the three most distinct samples used in the analysis of this study is presented. Table 13 presents a list with the countries contained in sample N1035. Table 14 presents a list with the countries contained in sample N234. Lastly, Table 15 presents a list with the countries contained in sample N1506. The number of countries contained in each one of these studies is 130, 25, and 155, respectively. In each one of these tables the countries are displayed in alphabetical order; the name of the countries used follows the standard framework used by the world development indicators (WDI) dataset presented by the World Bank as of July 2014.

Second, summary statistics for each of the alternative samples used in the analysis of this paper are presented. Figure 16 presents summary statistics for sample N2002. Figure 17 presents summary statistics for sample N1006. Figure 18 presents summary statistics for sample N234. Figure 19 presents summary statistics for sample N1509. Lastly, Figure 20 presents summary statistics for sample N1506.

Third a set of three figures is presented conveying the cross-sectional nature of the data under the base sample, N1035. Figure 16 presents a snapshot of the country-level private lending rates for the year 2011. Figure 17 presents a snapshot of the country-level

EFW ratings for the year 2011. Figure 18 presents a snapshot of the country-level WGI ratings for the year 2011.

Table 13: Country List for Sample N1035

Albania	Czech Republic	Latvia	Romania
Algeria	Denmark	Lebanon	Russian Federation
Angola	Dominican Republic	Lesotho	Rwanda
Argentina	Ecuador	Lithuania	Serbia
Armenia	Egypt, Arab Rep.	Macedonia, FYR	Sierra Leone
Australia	Estonia	Madagascar	Singapore
Azerbaijan	Ethiopia	Malawi	Slovak Republic
Bahamas, The	Fiji	Malaysia	Slovenia
Bahrain	Finland	Malta	South Africa
Bangladesh	France	Mauritania	Spain
Barbados	Gabon	Mauritius	Sri Lanka
Belgium	Gambia, The	Mexico	Suriname
Belize	Georgia	Moldova	Swaziland
Bolivia	Germany	Mongolia	Sweden
Bosnia and Herzegovina	Greece	Montenegro	Switzerland
Botswana	Guatemala	Morocco	Syrian Arab Republic
Brazil	Guyana	Mozambique	Tajikistan
Brunei Darussalam	Haiti	Namibia	Tanzania
Bulgaria	Honduras	Nepal	Thailand
Burundi	Hong Kong SAR, China	Netherlands	Timor-Leste
Cabo Verde	Hungary	New Zealand	Trinidad and Tobago
Cameroon	Iceland	Nicaragua	Uganda
Canada	India	Nigeria	Ukraine
Central African Republic	Indonesia	Norway	United Kingdom
Chad	Iran, Islamic Rep.	Oman	United States
Chile	Ireland	Pakistan	Uruguay
China	Israel	Panama	Venezuela, RB
Colombia	Italy	Papua New Guinea	Vietnam
Congo, Dem. Rep.	Japan	Paraguay	Yemen, Rep.
Congo, Rep.	Jordan	Peru	Zambia
Costa Rica	Kenya	Philippines	Zimbabwe
Croatia	Kuwait	Poland	
Cyprus	Kyrgyz Republic	Qatar	

Notes: The number of countries (and territories) presented in this table is 130.

Table 14: Country List for Sample N234

Albania	Dominican Republic	New Zealand	Trinidad and Tobago
Azerbaijan	Ethiopia	Nicaragua	Uganda
Botswana	Hong Kong SAR, China	Peru	United Kingdom
Brazil	Indonesia	Philippines	United States
Colombia	Kenya	Singapore	
Costa Rica	Malaysia	Slovenia	
Croatia	Moldova	Thailand	

Notes: The number of countries (and territories) presented in this table is 25.

Table 15: Country List for Sample N1506

Afghanistan	Czech Republic	Latvia	Russian Federation
Albania	Djibouti	Lebanon	Rwanda
Algeria	Dominica	Lesotho	Samoa
Angola	Dominican Republic	Liberia	Sao Tome & Principe
Antigua and Barbuda	Ecuador	Libya	Serbia
Argentina	Egypt, Arab Rep.	Lithuania	Seychelles
Armenia	Equatorial Guinea	Macao SAR, China	Sierra Leone
Aruba	Estonia	Macedonia, FYR	Singapore
Australia	Ethiopia	Madagascar	Slovak Republic
Azerbaijan	Fiji	Malawi	Slovenia
Bahamas, The	Finland	Malaysia	Solomon Islands
Bahrain	France	Maldives	South Africa
Bangladesh	Gabon	Malta	Sri Lanka
Barbados	Gambia, The	Mauritania	St. Kitts and Nevis
Belarus	Georgia	Mauritius	St. Lucia
Belgium	Greece	Mexico	St. Vinc. & Grenad.
Belize	Grenada	Micronesia, Fed. Sts.	Suriname
Bhutan	Guatemala	Moldova	Swaziland
Bolivia	Guyana	Mongolia	Sweden
Bosnia and Herzegovina	Haiti	Montenegro	Switzerland
Botswana	Honduras	Morocco	Syrian Arab Republic
Brazil	Hong Kong SAR, China	Mozambique	Tajikistan
Brunei Darussalam	Hungary	Namibia	Tanzania
Bulgaria	Iceland	Nepal	Thailand
Burundi	India	Netherlands	Timor-Leste
Cabo Verde	Indonesia	New Zealand	Tonga
Cameroon	Iran, Islamic Rep.	Nicaragua	Trinidad & Tobago
Canada	Iraq	Nigeria	Uganda
Central African Republic	Ireland	Norway	Ukraine
Chad	Israel	Oman	United Kingdom
Chile	Italy	Pakistan	United States
China	Japan	Panama	Uruguay
Colombia	Jordan	Papua New Guinea	Vanuatu
Comoros	Kenya	Paraguay	Venezuela, RB
Congo, Dem. Rep.	Korea, Rep.	Peru	Vietnam
Congo, Rep.	Kosovo	Philippines	Yemen, Rep.
Costa Rica	Kuwait	Poland	Zambia
Croatia	Kyrgyz Republic	Qatar	Zimbabwe
Cyprus	Lao PDR	Romania	

Notes: The number of countries (and territories) presented in this table is 155.

Table 16: Summary Statistics for Sample N2002

Variable	Mean	Std. Dev.	P10	P50	P90	Min	Max
<i>intrate</i>	13.9516	13.0091	5.5000	11.5479	22.6914	0.5000	278.9167
<i>EFW</i>	6.7760	0.9368	5.6000	6.9000	7.8000	2.9000	9.2000
<i>WGI</i>	-0.0384	0.9183	-1.1518	-0.1937	1.3080	-2.4911	1.9861
<i>GDP1000</i>	11.1886	17.4952	0.4245	3.4413	35.2116	0.1194	158.8025
<i>infGDPD</i>	6.5611	8.5488	0.5333	4.6326	15.4165	-32.8144	142.4782
<i>US10nir</i>	3.6592	0.9869	1.9700	4.0500	4.7600	1.9100	5.0400

Notes: The variable *intrate* stands for the private lending interest rate. The variable *EFW* stands for the summary Economic Freedom of the World index. The variable *WGI* stands for the summary worldwide governance indicator index. The variable *GDP1000* stands for national gross domestic product in thousands of constant 2005 U.S. dollars, divided by midyear population. The variable *infGDPD* stands for current year inflation. The variable *US10nir* stands for the annual nominal interest rate of 10-year U.S. Treasury bank notes. The statistics reported are in the following order: (1) arithmetic mean; (2) standard deviation; (3) 10th percentile threshold value; (4) 50th percentile threshold value; (5) 90th percentile threshold value; (6) minimum value; and (7) maximum value.

Table 17: Summary Statistics for Sample N1006

Variable	Mean	Std. Dev.	P10	P50	P90	Min	Max
<i>intrate</i>	13.3621	9.0945	5.3067	11.4500	22.1667	0.5000	67.7181
<i>EFW</i>	6.8426	0.8638	5.8000	6.9000	7.9000	3.7000	9.2000
<i>WGI</i>	0.0435	0.8603	-0.9386	-0.1929	1.4181	-1.6699	1.9861
<i>GDP1000</i>	9.8911	13.8539	0.4053	3.6085	34.5214	0.1411	67.8045
<i>infGDPD</i>	7.0977	7.5338	0.6126	5.6300	15.7628	-27.6317	68.4437
<i>US10nir</i>	4.0169	0.6716	3.3900	4.1500	4.7600	2.5200	5.0400

Notes: The variable *intrate* stands for the private lending interest rate. The variable *EFW* stands for the summary Economic Freedom of the World index. The variable *WGI* stands for the summary worldwide governance indicator index. The variable *GDP1000* stands for national gross domestic product in thousands of constant 2005 U.S. dollars, divided by midyear population. The variable *infGDPD* stands for current year inflation. The variable *US10nir* stands for the annual nominal interest rate of 10-year U.S. Treasury bank notes. The statistics reported are in the following order: (1) arithmetic mean; (2) standard deviation; (3) 10th percentile threshold value; (4) 50th percentile threshold value; (5) 90th percentile threshold value; (6) minimum value; and (7) maximum value.

Table 18: Summary Statistics for Sample N234

Variable	Mean	Std. Dev.	P10	P50	P90	Min	Max
<i>intrate</i>	13.7966	10.1148	5.0000	12.4177	22.1883	0.5000	67.0833
<i>EFW</i>	7.1714	0.8216	6.2000	7.0000	8.5000	5.4000	9.2000
<i>WGI</i>	0.1891	0.8158	-0.6854	-0.0279	1.4687	-1.0837	1.8717
<i>GDP1000</i>	10.6166	12.8909	0.5840	4.4456	31.8740	0.1600	45.4310
<i>infGDPD</i>	5.8831	6.6726	0.8169	4.6977	12.7518	-27.6317	45.1911
<i>US10nir</i>	3.9959	0.6803	2.5200	4.1500	4.7600	2.5200	5.0400

Notes: The variable *intrate* stands for the private lending interest rate. The variable *EFW* stands for the summary Economic Freedom of the World index. The variable *WGI* stands for the summary worldwide governance indicator index. The variable *GDP1000* stands for national gross domestic product in thousands of constant 2005 U.S. dollars, divided by midyear population. The variable *infGDPD* stands for current year inflation. The variable *US10nir* stands for the annual nominal interest rate of 10-year U.S. Treasury bank notes. The statistics reported are in the following order: (1) arithmetic mean; (2) standard deviation; (3) 10th percentile threshold value; (4) 50th percentile threshold value; (5) 90th percentile threshold value; (6) minimum value; and (7) maximum value.

Table 19: Summary Statistics for Sample N1509

Variable	Mean	Std. Dev.	P10	P50	P90	Min	Max
<i>intrate</i>	13.5497	9.3836	5.5000	11.4692	23.0300	0.5000	97.3358
<i>EFW</i>	6.8365	0.8691	5.8000	6.9000	7.9000	3.6000	9.2000
<i>WGI</i>	-0.0153	0.8387	-1.0187	-0.1902	1.2230	-1.7928	1.9861
<i>GDP1000</i>	9.1040	13.1082	0.4354	3.3766	30.7503	0.1333	67.8045
<i>infGDPD</i>	7.1531	9.1504	0.3940	5.3243	16.1200	-32.8144	142.4782
<i>US10nir</i>	3.8559	0.8558	2.5200	4.0500	4.7600	1.9700	5.0400

Notes: The variable *intrate* stands for the private lending interest rate. The variable *EFW* stands for the summary Economic Freedom of the World index. The variable *WGI* stands for the summary worldwide governance indicator index. The variable *GDP1000* stands for national gross domestic product in thousands of constant 2005 U.S. dollars, divided by midyear population. The variable *infGDPD* stands for current year inflation. The variable *US10nir* stands for the annual nominal interest rate of 10-year U.S. Treasury bank notes. The statistics reported are in the following order: (1) arithmetic mean; (2) standard deviation; (3) 10th percentile threshold value; (4) 50th percentile threshold value; (5) 90th percentile threshold value; (6) minimum value; and (7) maximum value.

Table 20: Summary Statistics for Sample N1506

Variable	Mean	Std. Dev.	P10	P50	P90	Min	Max
<i>intrate</i>	13.5626	9.3879	5.5000	11.5000	23.0300	0.5000	97.3358
<i>EFW</i>	6.8345	0.8694	5.8000	6.9000	7.9000	3.6000	9.2000
<i>WGI</i>	-0.0184	0.8365	-1.0187	-0.1917	1.2142	-1.7928	1.9861
<i>GDP1000</i>	9.0535	13.0667	0.4354	3.3593	30.4805	0.1333	67.8045
<i>infGDPD</i>	7.1619	9.1572	0.3940	5.3379	16.1200	-32.8144	142.4782
<i>US10nir</i>	3.8535	0.8550	2.5200	4.0500	4.7600	1.9700	5.0400

Notes: The variable *intrate* stands for the private lending interest rate. The variable *EFW* stands for the summary Economic Freedom of the World index. The variable *WGI* stands for the summary worldwide governance indicator index. The variable *GDP1000* stands for national gross domestic product in thousands of constant 2005 U.S. dollars, divided by midyear population. The variable *infGDPD* stands for current year inflation. The variable *US10nir* stands for the annual nominal interest rate of 10-year U.S. Treasury bank notes. The statistics reported are in the following order: (1) arithmetic mean; (2) standard deviation; (3) 10th percentile threshold value; (4) 50th percentile threshold value; (5) 90th percentile threshold value; (6) minimum value; and (7) maximum value.

Figure 16: Private Lending Rates in 2011
Nominal Lending Rates
Year 2011

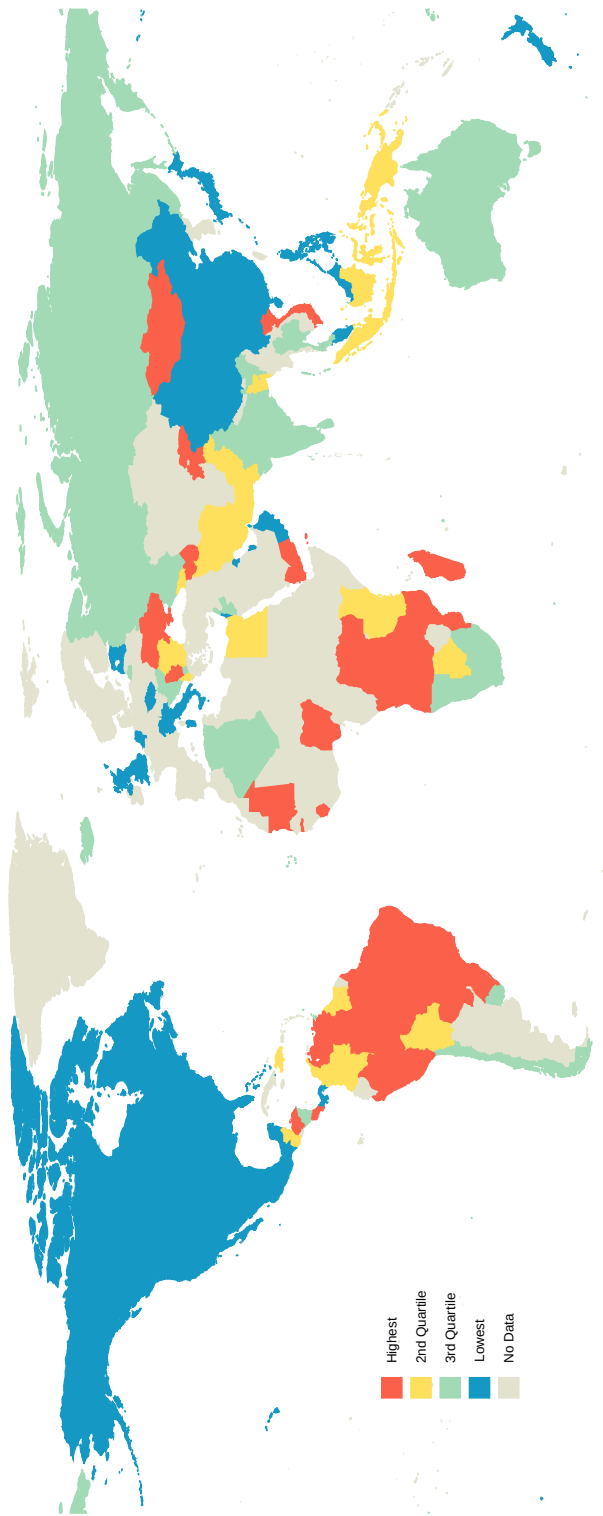


Figure 17: Economic Freedom of the World in 2011
Economic Freedom of the World
Year 2011

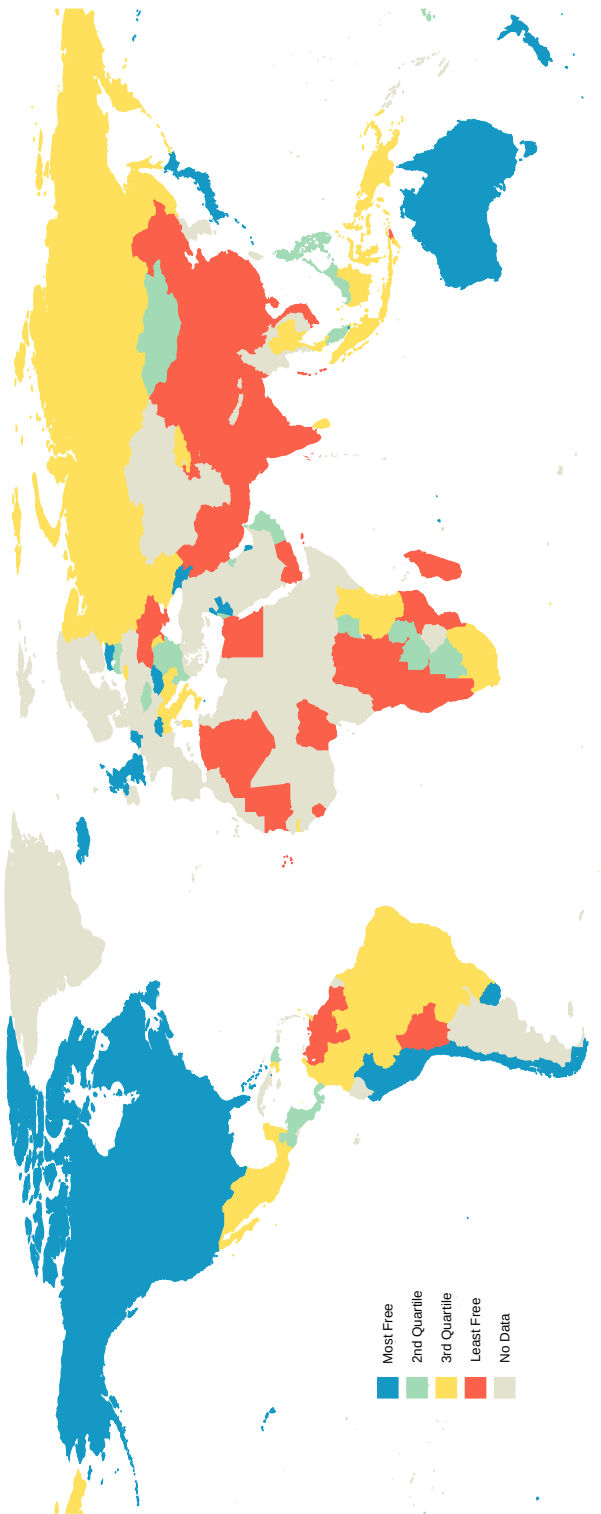
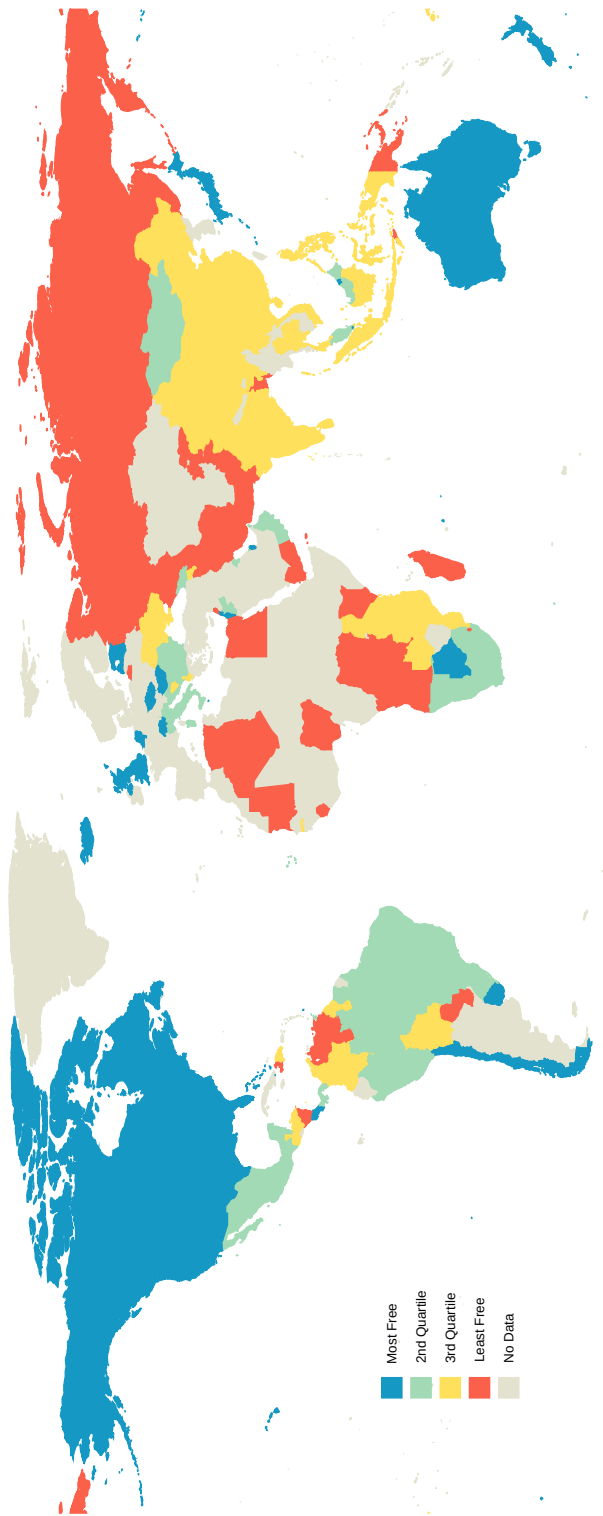


Figure 18: Worldwide Governance in 2011
Worldwide Governance Index
Year 2011



APPENDIX D

ADDITIONAL SENSITIVITY TESTS

The eight base models run in parallel throughout the paper account for many potential sensitivities. This subsection presents some additional sensitivity tests regarding the possible influences that any particular year may have on the results of this study. First, Tables 21 and 22 present the number of observations with non-missing values of the variables *intrate*, *EFW*, and *WGI* available for each year under all of the samples used in this study.

Table 21: Observations per Year (EFW Samples)

Year	N1035			N1006			N234		
	<i>EFW</i>	<i>WGI</i>	<i>intrate</i>	<i>EFW</i>	<i>WGI</i>	<i>intrate</i>	<i>EFW</i>	<i>WGI</i>	
2002	100	100	100	94	94	94	21	21	21
2003	101	101	101	98	98	98	20	20	20
2004	103	103	103	102	102	102	23	23	23
2005	111	111	111	111	111	111	25	25	25
2006	108	108	108	108	108	108	25	25	25
2007	108	108	108	108	108	108	25	25	25
2008	100	100	100	100	100	100	25	25	25
2009	98	98	98	98	98	98	24	24	24
2010	104	104	104	95	95	95	23	23	23
2011	102	102	102	92	92	92	23	23	23

Second, a jackknife estimation procedure is applied to all samples; all the results from these tests are found to be very qualitatively consistent. Table 23 presents the results of applying this estimation procedure to the base sample of this study, N1035; all results are available from the author upon request. The first column in Table 23 indicates the particular model specification to which the the jackknife procedure is being applied for each row: GDPyear stands for the model specification including GDP and year dummies; GDPyc stands for the model specification including both year and country dummies; and

Table 22: Observations per Year (Alternative Samples)

Year	N2002			N1509			N1506		
	<i>EFW</i>	<i>WGI</i>	<i>intrate</i>	<i>EFW</i>	<i>WGI</i>	<i>intrate</i>	<i>EFW</i>	<i>WGI</i>	
2002	152	123	187	140	100	140	137	97	137
2003	150	127	193	144	101	144	144	101	144
2004	154	130	197	145	103	145	145	103	145
2005	152	141	197	147	111	147	147	111	147
2006	150	141	198	143	108	143	143	108	143
2007	150	141	198	144	108	144	144	108	144
2008	142	141	200	136	100	136	136	100	136
2009	140	141	201	134	98	134	134	98	134
2010	137	153	201	129	105	129	129	105	129
2011	131	152	202	124	102	124	124	102	124
2012	128	0	202	123	0	123	123	0	123

the NoGDP models follow analogously, but they do not include the GDP control variable.

The second column indicates the particular year that is being omitted (*jackknifed*) from the regression in each row. The third column contains the coefficient associated with the Economic Freedom of the World index for the model specification indicated in each row. Lastly, the fourth column contains the *t*-value associated with the coefficient presented in Column (3).

The jackknife procedure consists of estimating a pooled OLS model with year dummies, in which a different year dummy is excluded from the regression in each row. This procedure is applied to the results of this study with the objective of identifying potential sensitivities to the time dimension of the data. The first row in Table 23 indicates that a pooled OLS model with year dummies and GDP is being estimated without omitting any year dummies from the specification; this model is identical to the one presented in Column (2) and row N1035 of Table 10.³⁶ The second row of Table 23

³⁶Each model from Table 23 for which no year dummy is jackknifed is identical to a model summarized in Table 10 for row N1035: the first is associated with Column (2); the second is associated with Column (4);

estimates a similar model to the one in Row (1), but it omits the year dummy for 2003.

The third row estimates a similar model to the one in Row (2), but this time it omits the year dummy for 2004 instead. The remainder of the table is populated accordingly.

Given that the significance of the EFW coefficients is not altered significantly by the particular year being jackknifed in each model, this procedure provides further evidence of the robustness of the results of this study to the temporal dimension of the data.

the third is associated with Column (6); and the last is associated with Column (8).

Table 23: Jackknife Procedure for Sample N1035

<i>Model</i>	<i>Jackknifed</i>	<i>Coefficient</i>	<i>t-value</i>
GDPyear	None	-1.6849	-4.4640
GDPyear	yeardummy2003	-1.6874	-4.4736
GDPyear	yeardummy2004	-1.7084	-4.5195
GDPyear	yeardummy2005	-1.7728	-4.7014
GDPyear	yeardummy2006	-1.8603	-4.9547
GDPyear	yeardummy2007	-1.7980	-4.7777
GDPyear	yeardummy2008	-1.8270	-4.8631
GDPyear	yeardummy2009	-1.7296	-4.5935
GDPyear	yeardummy2010	-1.7492	-4.6479
GDPyear	yeardummy2011	-1.8520	-4.9226
GDPyc	None	-1.0731	-1.9018
GDPyc	yeardummy2003	-1.1174	-1.9869
GDPyc	yeardummy2004	-1.1765	-2.0687
GDPyc	yeardummy2005	-1.6440	-2.9513
GDPyc	yeardummy2006	-2.2269	-4.1347
GDPyc	yeardummy2007	-2.0211	-3.6910
GDPyc	yeardummy2008	-1.9322	-3.4752
GDPyc	yeardummy2009	-1.6251	-2.9217
GDPyc	yeardummy2010	-1.9744	-3.5558
GDPyc	yeardummy2011	-2.3429	-4.2005
NoGDPyear	None	-3.1188	-9.6400
NoGDPyear	yeardummy2003	-3.1193	-9.6468
NoGDPyear	yeardummy2004	-3.1349	-9.6773
NoGDPyear	yeardummy2005	-3.1754	-9.8235
NoGDPyear	yeardummy2006	-3.2264	-10.0154
NoGDPyear	yeardummy2007	-3.1883	-9.8786
NoGDPyear	yeardummy2008	-3.2175	-9.9928
NoGDPyear	yeardummy2009	-3.1378	-9.7124
NoGDPyear	yeardummy2010	-3.1394	-9.7141
NoGDPyear	yeardummy2011	-3.2183	-9.9711
NoGDPyc	None	-1.2251	-2.1793
NoGDPyc	yeardummy2003	-1.2571	-2.2429
NoGDPyc	yeardummy2004	-1.2795	-2.2603
NoGDPyc	yeardummy2005	-1.6804	-3.0211
NoGDPyc	yeardummy2006	-2.2253	-4.1338
NoGDPyc	yeardummy2007	-2.0206	-3.6923
NoGDPyc	yeardummy2008	-1.9318	-3.4764
NoGDPyc	yeardummy2009	-1.6492	-2.9680
NoGDPyc	yeardummy2010	-1.9761	-3.5614
NoGDPyc	yeardummy2011	-2.3443	-4.2041

APPENDIX E

ADDITIONAL RESULTS

Table 24: EFW Index Results under Sample N2002 (GDP Included)

VARIABLES	(1) OLS	(2) Year	(3) Country	(4) Country & Year
zEFW	-0.378*** (0.0443)	-0.359*** (0.0451)	-0.301*** (0.0767)	-0.210** (0.0849)
zGDP1000	-0.0876* (0.0496)	-0.0982** (0.0499)	-0.517 (0.375)	0.0694 (0.439)
zlinfdiff	0.167*** (0.0519)		0.129*** (0.0370)	
zinfdiff	0.110*** (0.0406)		0.114*** (0.0301)	
zUS10nir	0.0593 (0.0469)		0.0538* (0.0307)	
zlinfl		0.169*** (0.0537)		0.126*** (0.0382)
zinfGDPD		0.129*** (0.0426)		0.131*** (0.0313)
Constant	-0.00689 (0.0363)	0.166 (0.101)	-0.118 (0.270)	0.311 (0.313)
Observations	1,044	1,044	1,044	1,044
R ²	0.202	0.206	0.730	0.733
Year FE	NO	YES	NO	YES
Country FE	NO	NO	YES	YES

Notes: All variables presented in this table have been standardized. The dependent variable is *intrate*, which represents the average national bank rate that usually meets the short-term and medium-term financing needs of the private sector. *EFW* represents the overall Economic Freedom of the World Index. *GDP1000* represents the national gross domestic product in thousands of constant 2005 U.S. dollars, divided by midyear population. The variable *infGDPD* represents inflation, as measured by the annual growth rate of the GDP implicit deflator. The variable *infdiff* is calculated by subtracting the US inflation rate from *infGDPD*. *US10nir* represents the annual nominal interest rate of 10-year U.S. Treasury bank notes. *linf* and *linfdiff* are the one-year lag value of *infGDPD* and *linfdiff*, respectively. Column (1) presents the results yielded by pooled OLS estimation. Column (2) presents the results yielded by including year fixed effects into the base model specification. Column (3) presents the results yielded by including country fixed effects into the base model specification. Column (4) presents the results yielded by including both year and country fixed effects into the base model specification. Standard errors are presented in parentheses. The standard notation is used to denote the level of statistical significance of each result: *** p<0.01, ** p<0.05, * p<0.1.

Table 25: EFW Index Results under Sample N2002 (GDP Not Included)

VARIABLES	(1) OLS	(2) Year	(3) Country	(4) Country & Year
zEFW	-0.402*** (0.0371)	-0.390*** (0.0377)	-0.305*** (0.0757)	-0.203** (0.0834)
zlinfdiff	0.160*** (0.0514)		0.126*** (0.0368)	
zinfdiff	0.108*** (0.0402)		0.106*** (0.0295)	
zUS10nir	0.0498 (0.0466)		0.0630** (0.0298)	
zlinfl		0.161*** (0.0532)		0.125*** (0.0379)
zinfGDPD		0.124*** (0.0422)		0.126*** (0.0307)
Constant	-0.00218 (0.0357)	0.139 (0.101)	0.122 (0.201)	0.267 (0.208)
Observations	1,056	1,056	1,056	1,056
R^2	0.190	0.194	0.729	0.733
Year FE	NO	YES	NO	YES
Country FE	NO	NO	YES	YES

Notes: All variables presented in this table have been standardized. The dependent variable is *intrate*, which represents the average national bank rate that usually meets the short-term and medium-term financing needs of the private sector. *EFW* represents the overall Economic Freedom of the World Index. *GDP1000* represents the national gross domestic product in thousands of constant 2005 U.S. dollars, divided by midyear population. The variable *infGDPD* represents inflation, as measured by the annual growth rate of the GDP implicit deflator. The variable *infdiff* is calculated by subtracting the US inflation rate from *infGDPD*. *US10nir* represents the annual nominal interest rate of 10-year U.S. Treasury bank notes. *linf* and *linfdiff* are the one-year lag value of *infGDPD* and *linfdiff*, respectively. Column (1) presents the results yielded by pooled OLS estimation. Column (2) presents the results yielded by including year fixed effects into the base model specification. Column (3) presents the results yielded by including country fixed effects into the base model specification. Column (4) presents the results yielded by including both year and country fixed effects into the base model specification. Standard errors are presented in parentheses. The standard notation is used to denote the level of statistical significance of each result: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 26: WGI Index Results under Sample N2002 (GDP Included)

VARIABLES	(1) OLS	(2) Year	(3) Country	(4) Country & Year
zWGI	-0.193*** (0.0407)	-0.197*** (0.0406)	-0.433*** (0.113)	-0.409*** (0.112)
zGDP1000	-0.164*** (0.0468)	-0.159*** (0.0467)	-0.408** (0.206)	0.0183 (0.220)
zlinfdiff	0.210*** (0.0325)		0.183*** (0.0217)	
zinfdiff	0.132*** (0.0262)		0.128*** (0.0173)	
zUS10nir	0.0804*** (0.0272)		0.0664*** (0.0173)	
zlinfl		0.201*** (0.0333)		0.175*** (0.0221)
zinfGDPD		0.144*** (0.0271)		0.137*** (0.0177)
Constant	-0.0518** (0.0248)	0.185** (0.0760)	-0.935*** (0.316)	-0.364 (0.332)
Observations	1,524	1,524	1,524	1,524
R ²	0.209	0.219	0.741	0.747
Year FE	NO	YES	NO	YES
Country FE	NO	NO	YES	YES

Notes: All variables presented in this table have been standardized. The dependent variable is *intrate*, which represents the average national bank rate that usually meets the short-term and medium-term financing needs of the private sector. *WGI* represents the overall Worldwide Governance Indicators Index. *GDP1000* represents the national gross domestic product in thousands of constant 2005 U.S. dollars, divided by midyear population. The variable *infGDPD* represents inflation, as measured by the annual growth rate of the GDP implicit deflator. The variable *infdiff* is calculated by subtracting the US inflation rate from *infGDPD*. *US10nir* represents the annual nominal interest rate of 10-year U.S. Treasury bank notes. *linf* and *linfdiff* are the one-year lag value of *infGDPD* and *linfdiff*, respectively. Column (1) presents the results yielded by pooled OLS estimation. Column (2) presents the results yielded by including year fixed effects into the base model specification. Column (3) presents the results yielded by including country fixed effects into the base model specification. Column (4) presents the results yielded by including both year and country fixed effects into the base model specification. Standard errors are presented in parentheses. The standard notation is used to denote the level of statistical significance of each result: *** p<0.01, ** p<0.05, * p<0.1.

Table 27: WGI Index Results under Sample N2002 (GDP Not Included)

VARIABLES	(1) OLS	(2) Year	(3) Country	(4) Country & Year
zWGI	-0.295*** (0.0277)	-0.296*** (0.0276)	-0.447*** (0.112)	-0.414*** (0.112)
zlinfdiff	0.199*** (0.0323)		0.183*** (0.0216)	
zinfdiff	0.123*** (0.0260)		0.124*** (0.0171)	
zUS10nir	0.0782*** (0.0270)		0.0746*** (0.0167)	
zlinfl		0.191*** (0.0331)		0.175*** (0.0220)
zinfGDPD		0.135*** (0.0269)		0.135*** (0.0175)
Constant	-0.0307 (0.0239)	0.201*** (0.0754)	-0.705** (0.291)	-0.386 (0.294)
Observations	1,538	1,538	1,538	1,538
R ²	0.199	0.209	0.740	0.746
Year FE	NO	YES	NO	YES
Country FE	NO	NO	YES	YES

Notes: All variables presented in this table have been standardized. The dependent variable is *intrate*, which represents the average national bank rate that usually meets the short-term and medium-term financing needs of the private sector. *WGI* represents the overall Worldwide Governance Indicators Index. *GDP1000* represents the national gross domestic product in thousands of constant 2005 U.S. dollars, divided by midyear population. The variable *infGDPD* represents inflation, as measured by the annual growth rate of the GDP implicit deflator. The variable *infdiff* is calculated by subtracting the US inflation rate from *infGDPD*. *US10nir* represents the annual nominal interest rate of 10-year U.S. Treasury bank notes. *linf* and *linfdiff* are the one-year lag value of *infGDPD* and *linfdiff*, respectively. Column (1) presents the results yielded by pooled OLS estimation. Column (2) presents the results yielded by including year fixed effects into the base model specification. Column (3) presents the results yielded by including country fixed effects into the base model specification. Column (4) presents the results yielded by including both year and country fixed effects into the base model specification. Standard errors are presented in parentheses. The standard notation is used to denote the level of statistical significance of each result: *** p<0.01, ** p<0.05, * p<0.1.

Table 28: WGI Index Results under Sample N1035 (GDP Included)

VARIABLES	(1) OLS	(2) Year	(3) Country	(4) Country & Year
zWGI	-0.249*** (0.0454)	-0.254*** (0.0451)	-0.764*** (0.118)	-0.813*** (0.113)
zGDP1000	-0.123*** (0.0428)	-0.118*** (0.0424)	-0.346* (0.199)	0.707*** (0.222)
zlinfdiff	0.196*** (0.0284)		0.0916*** (0.0168)	
zinfdiff	0.198*** (0.0289)		0.120*** (0.0175)	
zUS10nir	0.0571** (0.0256)		0.0599*** (0.0138)	
zlinfl		0.196*** (0.0294)		0.0861*** (0.0166)
zinfGDPD		0.220*** (0.0300)		0.138*** (0.0174)
Constant	8.56e-10 (0.0254)	0.295*** (0.0812)	-0.433** (0.173)	0.426** (0.189)
Observations	1,035	1,035	1,035	1,035
R ²	0.337	0.353	0.848	0.864
Year FE	NO	YES	NO	YES
Country FE	NO	NO	YES	YES

Notes: All variables presented in this table have been standardized. The dependent variable is *intrate*, which represents the average national bank rate that usually meets the short-term and medium-term financing needs of the private sector. *WGI* represents the overall Worldwide Governance Indicators Index. *GDP1000* represents the national gross domestic product in thousands of constant 2005 U.S. dollars, divided by midyear population. The variable *infGDPD* represents inflation, as measured by the annual growth rate of the GDP implicit deflator. The variable *infdiff* is calculated by subtracting the US inflation rate from *infGDPD*. *US10nir* represents the annual nominal interest rate of 10-year U.S. Treasury bank notes. *linf* and *linfdiff* are the one-year lag value of *infGDPD* and *linfdiff*, respectively. Column (1) presents the results yielded by pooled OLS estimation. Column (2) presents the results yielded by including year fixed effects into the base model specification. Column (3) presents the results yielded by including country fixed effects into the base model specification. Column (4) presents the results yielded by including both year and country fixed effects into the base model specification. Standard errors are presented in parentheses. The standard notation is used to denote the level of statistical significance of each result: *** p<0.01, ** p<0.05, * p<0.1.

Table 29: WGI Index Results under Sample N1035 (GDP Not Included)

VARIABLES	(1) OLS	(2) Year	(3) Country	(4) Country & Year
zWGI	-0.350*** (0.0289)	-0.352*** (0.0287)	-0.777*** (0.118)	-0.787*** (0.113)
zlinfdiff	0.197*** (0.0285)		0.0906*** (0.0168)	
zinfdiff	0.192*** (0.0289)		0.117*** (0.0175)	
zUS10nir	0.0577** (0.0257)		0.0649*** (0.0135)	
zlinfl		0.197*** (0.0295)		0.0879*** (0.0167)
zinfGDPD		0.215*** (0.0300)		0.139*** (0.0174)
Constant	1.08e-09 (0.0255)	0.298*** (0.0815)	-0.264* (0.143)	0.0232 (0.142)
Observations	1,035	1,035	1,035	1,035
R ²	0.332	0.348	0.848	0.862
Year FE	NO	YES	NO	YES
Country FE	NO	NO	YES	YES

Notes: All variables presented in this table have been standardized. The dependent variable is *intrate*, which represents the average national bank rate that usually meets the short-term and medium-term financing needs of the private sector. *WGI* represents the overall Worldwide Governance Indicators Index. *GDP1000* represents the national gross domestic product in thousands of constant 2005 U.S. dollars, divided by midyear population. The variable *infGDPD* represents inflation, as measured by the annual growth rate of the GDP implicit deflator. The variable *infdiff* is calculated by subtracting the US inflation rate from *infGDPD*. *US10nir* represents the annual nominal interest rate of 10-year U.S. Treasury bank notes. *linf* and *linfdiff* are the one-year lag value of *infGDPD* and *linfdiff*, respectively. Column (1) presents the results yielded by pooled OLS estimation. Column (2) presents the results yielded by including year fixed effects into the base model specification. Column (3) presents the results yielded by including country fixed effects into the base model specification. Column (4) presents the results yielded by including both year and country fixed effects into the base model specification. Standard errors are presented in parentheses. The standard notation is used to denote the level of statistical significance of each result: *** p<0.01, ** p<0.05, * p<0.1.

Table 30: EFW Index Results under Sample N1006 (GDP Included)

VARIABLES	(1) OLS	(2) Year	(3) Country	(4) Country & Year
zEFW	-0.119*** (0.0347)	-0.0968*** (0.0351)	-0.256*** (0.0469)	-0.105** (0.0502)
zGDP1000	-0.242*** (0.0325)	-0.251*** (0.0325)	-0.288 (0.195)	0.606*** (0.220)
zlinfdiff	0.224*** (0.0288)		0.101*** (0.0167)	
zinfdiff	0.219*** (0.0292)		0.120*** (0.0174)	
zUS10nir	0.0489* (0.0259)		0.0592*** (0.0137)	
zlinfl		0.227*** (0.0298)		0.0985*** (0.0167)
zinfGDPD		0.245*** (0.0306)		0.145*** (0.0175)
Constant	1.33e-09 (0.0255)	0.276*** (0.0838)	0.0390 (0.165)	0.796*** (0.183)
Observations	1,006	1,006	1,006	1,006
R ²	0.348	0.359	0.851	0.863
Year FE	NO	YES	NO	YES
Country FE	NO	NO	YES	YES

Notes: All variables presented in this table have been standardized. The dependent variable is *intrate*, which represents the average national bank rate that usually meets the short-term and medium-term financing needs of the private sector. *EFW* represents the overall Economic Freedom of the World Index. *GDP1000* represents the national gross domestic product in thousands of constant 2005 U.S. dollars, divided by midyear population. The variable *infGDPD* represents inflation, as measured by the annual growth rate of the GDP implicit deflator. The variable *infdiff* is calculated by subtracting the US inflation rate from *infGDPD*. *US10nir* represents the annual nominal interest rate of 10-year U.S. Treasury bank notes. *linf* and *linfdiff* are the one-year lag value of *infGDPD* and *linfdiff*, respectively. Column (1) presents the results yielded by pooled OLS estimation. Column (2) presents the results yielded by including year fixed effects into the base model specification. Column (3) presents the results yielded by including country fixed effects into the base model specification. Column (4) presents the results yielded by including both year and country fixed effects into the base model specification. Standard errors are presented in parentheses. The standard notation is used to denote the level of statistical significance of each result: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 31: EFW Index Results under Sample N1006 (GDP Not Included)

VARIABLES	(1) OLS	(2) Year	(3) Country	(4) Country & Year
zEFW	-0.259*** (0.0299)	-0.245*** (0.0302)	-0.264*** (0.0467)	-0.121** (0.0500)
zlinfdiff	0.235*** (0.0296)		0.101*** (0.0167)	
zinfdiff	0.231*** (0.0299)		0.117*** (0.0173)	
zUS10nir	0.0404 (0.0265)		0.0631*** (0.0134)	
zlinfl		0.238*** (0.0306)		0.0992*** (0.0168)
zinfGDPD		0.254*** (0.0314)		0.146*** (0.0176)
Constant	1.25e-09 (0.0262)	0.244*** (0.0861)	0.186 (0.131)	0.446*** (0.132)
Observations	1,006	1,006	1,006	1,006
R ²	0.312	0.321	0.851	0.862
Year FE	NO	YES	NO	YES
Country FE	NO	NO	YES	YES

Notes: All variables presented in this table have been standardized. The dependent variable is *intrate*, which represents the average national bank rate that usually meets the short-term and medium-term financing needs of the private sector. *EFW* represents the overall Economic Freedom of the World Index. *GDP1000* represents the national gross domestic product in thousands of constant 2005 U.S. dollars, divided by midyear population. The variable *infGDPD* represents inflation, as measured by the annual growth rate of the GDP implicit deflator. The variable *infdiff* is calculated by subtracting the US inflation rate from *infGDPD*. *US10nir* represents the annual nominal interest rate of 10-year U.S. Treasury bank notes. *linf* and *linfdiff* are the one-year lag value of *infGDPD* and *linfdiff*, respectively. Column (1) presents the results yielded by pooled OLS estimation. Column (2) presents the results yielded by including year fixed effects into the base model specification. Column (3) presents the results yielded by including country fixed effects into the base model specification. Column (4) presents the results yielded by including both year and country fixed effects into the base model specification. Standard errors are presented in parentheses. The standard notation is used to denote the level of statistical significance of each result: *** p<0.01, ** p<0.05, * p<0.1.

Table 32: WGI Index Results under Sample N1006 (GDP Included)

VARIABLES	(1) OLS	(2) Year	(3) Country	(4) Country & Year
zWGI	-0.211*** (0.0458)	-0.216*** (0.0455)	-0.813*** (0.114)	-0.865*** (0.108)
zGDP1000	-0.148*** (0.0431)	-0.142*** (0.0429)	-0.315 (0.192)	0.780*** (0.212)
zlinfdiff	0.221*** (0.0286)		0.0971*** (0.0166)	
zinfdiff	0.212*** (0.0290)		0.121*** (0.0172)	
zUS10nir	0.0565** (0.0257)		0.0684*** (0.0135)	
zlinfl		0.220*** (0.0294)		0.0907*** (0.0162)
zinfGDPD		0.233*** (0.0302)		0.140*** (0.0168)
Constant	1.52e-09 (0.0254)	0.307*** (0.0827)	-0.428** (0.167)	0.499*** (0.181)
Observations	1,006	1,006	1,006	1,006
R ²	0.355	0.369	0.854	0.872
Year FE	NO	YES	NO	YES
Country FE	NO	NO	YES	YES

Notes: All variables presented in this table have been standardized. The dependent variable is *intrate*, which represents the average national bank rate that usually meets the short-term and medium-term financing needs of the private sector. *WGI* represents the overall Worldwide Governance Indicators Index. *GDP1000* represents the national gross domestic product in thousands of constant 2005 U.S. dollars, divided by midyear population. The variable *infGDPD* represents inflation, as measured by the annual growth rate of the GDP implicit deflator. The variable *infdiff* is calculated by subtracting the US inflation rate from *infGDPD*. *US10nir* represents the annual nominal interest rate of 10-year U.S. Treasury bank notes. *linf* and *linfdiff* are the one-year lag value of *infGDPD* and *linfdiff*, respectively. Column (1) presents the results yielded by pooled OLS estimation. Column (2) presents the results yielded by including year fixed effects into the base model specification. Column (3) presents the results yielded by including country fixed effects into the base model specification. Column (4) presents the results yielded by including both year and country fixed effects into the base model specification. Standard errors are presented in parentheses. The standard notation is used to denote the level of statistical significance of each result: *** p<0.01, ** p<0.05, * p<0.1.

Table 33: WGI Index Results under Sample N1006 (GDP Not Included)

VARIABLES	(1) OLS	(2) Year	(3) Country	(4) Country & Year
zWGI	-0.333*** (0.0290)	-0.333*** (0.0288)	-0.825*** (0.114)	-0.836*** (0.109)
zlinfdiff	0.219*** (0.0287)		0.0962*** (0.0166)	
zinfdiff	0.207*** (0.0291)		0.118*** (0.0171)	
zUS10nir	0.0567** (0.0258)		0.0729*** (0.0132)	
zlinfl		0.219*** (0.0296)		0.0924*** (0.0163)
zinfGDPD		0.229*** (0.0303)		0.142*** (0.0170)
Constant	1.58e-09 (0.0255)	0.312*** (0.0831)	-0.275** (0.139)	0.0585 (0.137)
Observations	1,006	1,006	1,006	1,006
R ²	0.347	0.362	0.854	0.870
Year FE	NO	YES	NO	YES
Country FE	NO	NO	YES	YES

Notes: All variables presented in this table have been standardized. The dependent variable is *intrate*, which represents the average national bank rate that usually meets the short-term and medium-term financing needs of the private sector. *WGI* represents the overall Worldwide Governance Indicators Index. *GDP1000* represents the national gross domestic product in thousands of constant 2005 U.S. dollars, divided by midyear population. The variable *infGDPD* represents inflation, as measured by the annual growth rate of the GDP implicit deflator. The variable *infdiff* is calculated by subtracting the US inflation rate from *infGDPD*. *US10nir* represents the annual nominal interest rate of 10-year U.S. Treasury bank notes. *linf* and *linfdiff* are the one-year lag value of *infGDPD* and *linfdiff*, respectively. Column (1) presents the results yielded by pooled OLS estimation. Column (2) presents the results yielded by including year fixed effects into the base model specification. Column (3) presents the results yielded by including country fixed effects into the base model specification. Column (4) presents the results yielded by including both year and country fixed effects into the base model specification. Standard errors are presented in parentheses. The standard notation is used to denote the level of statistical significance of each result: *** p<0.01, ** p<0.05, * p<0.1.

Table 34: WGI Index Results under Sample N234 (GDP Included)

VARIABLES	(1) OLS	(2) Year	(3) Country	(4) Country & Year
zWGI	0.0918 (0.117)	0.0664 (0.120)	-0.0218 (0.166)	-0.0204 (0.152)
zGDP1000	-0.418*** (0.117)	-0.387*** (0.119)	-0.284 (0.205)	0.630*** (0.227)
zlinfdiff	0.190*** (0.0623)		0.0751*** (0.0215)	
zinfdiff	0.142** (0.0620)		0.0699*** (0.0215)	
zUS10nir	0.0778 (0.0578)		0.0751*** (0.0189)	
zlinfl		0.194*** (0.0660)		0.0675*** (0.0202)
zinfGDPD		0.165** (0.0670)		0.0869*** (0.0206)
Constant	-1.64e-09 (0.0568)	0.295 (0.195)	-0.204 (0.182)	0.736*** (0.210)
Observations	234	234	234	234
R ²	0.261	0.274	0.936	0.950
Year FE	NO	YES	NO	YES
Country FE	NO	NO	YES	YES

Notes: All variables presented in this table have been standardized. The dependent variable is *intrate*, which represents the average national bank rate that usually meets the short-term and medium-term financing needs of the private sector. *WGI* represents the overall Worldwide Governance Indicators Index. *GDP1000* represents the national gross domestic product in thousands of constant 2005 U.S. dollars, divided by midyear population. The variable *infGDPD* represents inflation, as measured by the annual growth rate of the GDP implicit deflator. The variable *infdiff* is calculated by subtracting the US inflation rate from *infGDPD*. *US10nir* represents the annual nominal interest rate of 10-year U.S. Treasury bank notes. *linf* and *linfdiff* are the one-year lag value of *infGDPD* and *linfdiff*, respectively. Column (1) presents the results yielded by pooled OLS estimation. Column (2) presents the results yielded by including year fixed effects into the base model specification. Column (3) presents the results yielded by including country fixed effects into the base model specification. Column (4) presents the results yielded by including both year and country fixed effects into the base model specification. Standard errors are presented in parentheses. The standard notation is used to denote the level of statistical significance of each result: *** p<0.01, ** p<0.05, * p<0.1.

Table 35: WGI Index Results under Sample N234 (GDP Not Included)

VARIABLES	(1) OLS	(2) Year	(3) Country	(4) Country & Year
zWGI	-0.262*** (0.0650)	-0.262*** (0.0656)	-0.0304 (0.167)	0.00540 (0.154)
zlinfdiff	0.211*** (0.0636)		0.0751*** (0.0215)	
zinfdiff	0.150** (0.0635)		0.0673*** (0.0214)	
zUS10nir	0.0914 (0.0591)		0.0823*** (0.0182)	
zlinfl		0.215*** (0.0671)		0.0685*** (0.0206)
zinfGDPD		0.177** (0.0683)		0.0876*** (0.0209)
Constant	-3.18e-09 (0.0582)	0.361* (0.198)	-0.0417 (0.139)	0.293** (0.139)
Observations	234	234	234	234
R ²	0.220	0.239	0.935	0.948
Year FE	NO	YES	NO	YES
Country FE	NO	NO	YES	YES

Notes: All variables presented in this table have been standardized. The dependent variable is *intrate*, which represents the average national bank rate that usually meets the short-term and medium-term financing needs of the private sector. *WGI* represents the overall Worldwide Governance Indicators Index. *GDP1000* represents the national gross domestic product in thousands of constant 2005 U.S. dollars, divided by midyear population. The variable *infGDPD* represents inflation, as measured by the annual growth rate of the GDP implicit deflator. The variable *infdiff* is calculated by subtracting the US inflation rate from *infGDPD*. *US10nir* represents the annual nominal interest rate of 10-year U.S. Treasury bank notes. *linf* and *linfdiff* are the one-year lag value of *infGDPD* and *linfdiff*, respectively. Column (1) presents the results yielded by pooled OLS estimation. Column (2) presents the results yielded by including year fixed effects into the base model specification. Column (3) presents the results yielded by including country fixed effects into the base model specification. Column (4) presents the results yielded by including both year and country fixed effects into the base model specification. Standard errors are presented in parentheses. The standard notation is used to denote the level of statistical significance of each result: *** p<0.01, ** p<0.05, * p<0.1.

Table 36: EFW Index Results under Sample N1506 (GDP Included)

VARIABLES	(1) OLS	(2) Year	(3) Country	(4) Country & Year
zEFW	-0.176*** (0.0345)	-0.154*** (0.0349)	-0.241*** (0.0483)	-0.0972* (0.0518)
zGDP1000	-0.202*** (0.0304)	-0.211*** (0.0304)	-0.299 (0.189)	0.513** (0.214)
zlinfdiff	0.246*** (0.0361)		0.122*** (0.0214)	
zinfdiff	0.250*** (0.0355)		0.147*** (0.0218)	
zUS10nir	0.0568* (0.0332)		0.0658*** (0.0179)	
zlinfl		0.249*** (0.0373)		0.118*** (0.0214)
zinfGDPD		0.280*** (0.0371)		0.176*** (0.0220)
Constant	0.00699 (0.0264)	0.269*** (0.0843)	0.0106 (0.163)	0.664*** (0.180)
Observations	1,033	1,033	1,033	1,033
R ²	0.334	0.345	0.845	0.856
Year FE	NO	YES	NO	YES
Country FE	NO	NO	YES	YES

Notes: All variables presented in this table have been standardized. The dependent variable is *intrate*, which represents the average national bank rate that usually meets the short-term and medium-term financing needs of the private sector. *EFW* represents the overall Economic Freedom of the World Index. *GDP1000* represents the national gross domestic product in thousands of constant 2005 U.S. dollars, divided by midyear population. The variable *infGDPD* represents inflation, as measured by the annual growth rate of the GDP implicit deflator. The variable *infdiff* is calculated by subtracting the US inflation rate from *infGDPD*. *US10nir* represents the annual nominal interest rate of 10-year U.S. Treasury bank notes. *linf* and *linfdiff* are the one-year lag value of *infGDPD* and *linfdiff*, respectively. Column (1) presents the results yielded by pooled OLS estimation. Column (2) presents the results yielded by including year fixed effects into the base model specification. Column (3) presents the results yielded by including country fixed effects into the base model specification. Column (4) presents the results yielded by including both year and country fixed effects into the base model specification. Standard errors are presented in parentheses. The standard notation is used to denote the level of statistical significance of each result: *** p<0.01, ** p<0.05, * p<0.1.

Table 37: EFW Index Results under Sample N1506 (GDP Not Included)

VARIABLES	(1) OLS	(2) Year	(3) Country	(4) Country & Year
zEFW	-0.300*** (0.0296)	-0.286*** (0.0299)	-0.249*** (0.0481)	-0.111** (0.0517)
zlinfdiff	0.263*** (0.0368)		0.120*** (0.0214)	
zinfdiff	0.259*** (0.0362)		0.143*** (0.0217)	
zUS10nir	0.0472 (0.0338)		0.0713*** (0.0176)	
zlinfl		0.267*** (0.0380)		0.119*** (0.0215)
zinfGDPD		0.286*** (0.0380)		0.176*** (0.0220)
Constant	-0.00436 (0.0269)	0.223*** (0.0860)	0.153 (0.136)	0.383*** (0.137)
Observations	1,033	1,033	1,033	1,033
R ²	0.305	0.314	0.845	0.855
Year FE	NO	YES	NO	YES
Country FE	NO	NO	YES	YES

Notes: All variables presented in this table have been standardized. The dependent variable is *intrate*, which represents the average national bank rate that usually meets the short-term and medium-term financing needs of the private sector. *EFW* represents the overall Economic Freedom of the World Index. *GDP1000* represents the national gross domestic product in thousands of constant 2005 U.S. dollars, divided by midyear population. The variable *infGDPD* represents inflation, as measured by the annual growth rate of the GDP implicit deflator. The variable *infdiff* is calculated by subtracting the US inflation rate from *infGDPD*. *US10nir* represents the annual nominal interest rate of 10-year U.S. Treasury bank notes. *linf* and *linfdiff* are the one-year lag value of *infGDPD* and *linfdiff*, respectively. Column (1) presents the results yielded by pooled OLS estimation. Column (2) presents the results yielded by including year fixed effects into the base model specification. Column (3) presents the results yielded by including country fixed effects into the base model specification. Column (4) presents the results yielded by including both year and country fixed effects into the base model specification. Standard errors are presented in parentheses. The standard notation is used to denote the level of statistical significance of each result: *** p<0.01, ** p<0.05, * p<0.1.

APPENDIX F

WGI DATA SOURCES

Table 38: WGI Data Sources (Source: www.govindicators.org)

Source	Type*	Public Countries	1996	1998	2000	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
African Development Bank Country Policy and Institutional Assessments	Expert (GOV) Partial	54	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Afrobarometer	Survey	22		x	x	x	x	x	x	x	x	x	x	x	x	x
Asian Development Bank Country Policy and Institutional Assessments	Expert (GOV) Partial	28		x	x	x	x	x	x	x	x	x	x	x	x	x
Business Enterprise Environment Survey	Survey	30		x	x	x	x	x	x	x	x	x	x	x	x	x
Bertelsmann Transformation Index	Expert (NGO)	129		x	x	x	x	x	x	x	x	x	x	x	x	x
Freedom House Countries at the Crossroads	Expert (NGO)	69														
European Bank for Reconstruction and Development Transition Report	Expert (GOV)	33		x	x	x	x	x	x	x	x	x	x	x	x	x
Economist Intelligence Unit Riskwire & Democracy Index	Expert (CBIP)	183		x	x	x	x	x	x	x	x	x	x	x	x	x
Freedom House	Expert (NGO)	198		x	x	x	x	x	x	x	x	x	x	x	x	x
Transparency International Global Corruption Barometer Survey	Survey	115														
World Economic Forum Global Competitiveness Report	Survey	144		x	x	x	x	x	x	x	x	x	x	x	x	x
Global Integrity Index	Expert (NGO)	62														
Gallup World Poll	Survey	161														
Heritage Foundation Index of Economic Freedom	Expert (NGO)	183		x	x	x	x	x	x	x	x	x	x	x	x	x
Cingranelli Richards Human Rights Database and Political Terror Scale	Expert (GOV)	194		x	x	x	x	x	x	x	x	x	x	x	x	x
IFAD Rural Sector Performance Assessments	Expert (GOV)	98														
IJET Country Security Risk Ratings	Expert (CBIP)	197														
Institutional Profiles Database	Expert (GOV)	143														
IREEP African Electoral Index	Expert (NGO)	54		x	x	x	x	x	x	x	x	x	x	x	x	x
Latinobarometro	Survey	18		x	x	x	x	x	x	x	x	x	x	x	x	x
International Research and Exchanges Board Media Sustainability Index	Expert (NGO)	76														
International Budget Project Open Budget Index	Expert (NGO)	100														
World Bank Country Policy and Institutional Assessments	Expert (GOV) Partial	136		x	x	x	x	x	x	x	x	x	x	x	x	x
Political Economic Risk Consultancy Corruption in Asia Survey	Survey	17		x	x	x	x	x	x	x	x	x	x	x	x	x
Political Risk Services International Country Risk Guide	Expert (CBIP)	140		x	x	x	x	x	x	x	x	x	x	x	x	x
Reporters Without Borders Press Freedom Index	Expert (NGO)	177														
US State Department Trafficking in People report	Expert (GOV)	185		x	x	x	x	x	x	x	x	x	x	x	x	x
Vanderbilt University Americas Barometer	Survey	26														
Institute for Management and Development World Competitiveness Yearbook	Survey	59		x	x	x	x	x	x	x	x	x	x	x	x	x
World Justice Project Rule of Law Index	Expert (NGO)	97														
Global Insight Business Conditions and Risk Indicators	Expert (CBIP)	203		x	x	x	x	x	x	x	x	x	x	x	x	x

*Types of Expert Assessments: CBIP -- Commercial Business Information Provider, GOV -- Public Sector Data Provider, NGO -- Nongovernmental Organization Data Provider