

T.C.
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SOSYAL BİLİMLER ENSTİTÜSÜ
İKTİSAT (İNG.) ANABİLİM DALI
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**THE ROLE OF INSTITUTIONS AND GOVERNANCE IN INTERNATIONAL
TRADE**

PhD Dissertation

MEHMET BABACAN

İstanbul, 2011

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Supervisor: Prof. Fatma Doğruel

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Marmara Üniversitesi
Sosyal Bilimler Enstitüsü Müdürlüğü

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To my dearest loves in life...

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ÖZET

KURUMLARIN VE YÖNETİŞİMİN ULUSLARARASI TİCARET İÇİNDEKİ ROLÜ

Bu çalışmada kurumlar ve yönetim unsurlarının genelde uluslararası ticaret; özelde ise ikili ticaret hacmi üzerindeki etkisi tarihi bir perspektiften hareketle anlaşılmaya ve cari uygulamalı örneklerle ortaya konmaya çalışılmıştır. Kurumlar ve uluslararası ticaret arasındaki karşılıklı geçişler ve tamamlayıcı öğelerin kısaca vurgulanmasından sonra her iki literatürün kesişme noktaları literatürden örneklerle belirtilmiştir. Elinizdeki eserin esas konusu ise çok uluslu ve mukayeseli bir ampirik çalışma sayesinde hangi kurumlar ve onların ürettiği yönetim unsurlarının ikili ticaret hacmi üzerinde –daha etkili olduğunun cevabının bulunmasıdır. Bu bölümde kullanılan göstergeler ve diğer etkenler (ekonomik, coğrafi vb.) arasındaki ilişkiler ve nihayet ikili ticaret hacmine etkileri çeşitli istatistik ve ekonometrik araçlar yoluyla ortaya konmuştur. Sonuç olarak, 9 farklı yönetim unsurunu barındıran global yönetim değişkeni ve bunun alt kümesi olan bürokratik kalite, yolsuzluk ve hukuk düzeninin varlığı gibi unsurlar bir yandan temel bir kategori olarak yönetsel ya da yönetim kalitesinin belirleyicisiyken; öte yandan ikili ticaret hacmine etkileri bakımından diğer yönetim unsurlarından ve coğrafi etkenlerden daha baskın görünmektedir. Bir bütün halinde bakıldığında sonuçlar yer yer çelişkili ve literatürdeki varsayımlara karşı önermeler yapmaktadır. Coğrafya ve kurumların etkileşiminin dış ticaret oranına etkilerinin incelendiği bu çalışmada değişkenlere dair pek az genelleme yapılabileceği sonucunu elde etmemizin yanısıra politika yapımını da ilgilendirir çıkarımlar mümkün görünmektedir. Yönetişim unsurlarının uluslararası ticarete etkisi bakımından ortaya çıkan sonuç ise yönetişimin teker teker değil; pek çok unsurun bir bileşkesi şeklinde anlaşılabilir bir fenomen olduğudur.

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ABSTRACT

THE ROLE OF INSTITUTIONS AND GOVERNANCE IN INTERNATIONAL TRADE

This dissertation aims at understanding and revealing the role of institutions and governance indicators on international trade in general and bilateral trade in specific, under a historical and empirical framework. Following a brief introduction to the literature on institutions, governance and international trade; there come examples of studies that highlight the intersections of and interplay between these three lines of research. The main point of the dissertation is to seek an understanding and provide insightful thinking on the role of governance indicators in explaining the bilateral trade volume among countries while analyzing the magnitude and the effect of different indicators with those of geographical and other components. With the help of statistical and econometric tools, this dissertation concludes that aggregated governance indicator –including 9 individual indicators- and administrative quality as a sub-category among other governance indicators which is measured specifically by the bureaucratic quality, the extent of law and order and the level of corruption in a given country, is significantly associated with the rise in trade share. A number of governance indicators are also persistently found to be more effective on the level of bilateral trade between countries where they enter into the gravity equation one by one, compared to the geographical and other components. The overall results however pose mixed conclusions for the estimations while. On the policy-making side; our results open the door into a wide range of speculation and interpretations with the most general conclusion that the effect of governance on international trade should be assessed as a general phenomenon that incorporates a set of inter-related components rather than to be explained by individual indicators.

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LIST OF ABBREVIATIONS

2SLS	Two Stage Least Squares
3SLS	Three Stage Least Squares
AIT	Agreement on Internal Trade
AR	Auto-Regressive
BERI	Business and Environmental Risk Intelligence
BI	Business International
BSEC	Black Sea Economic Cooperation
CCI	Control of Corruption Index
CES	Constant-Elasticity-of-Substitution
CIA	Central Intelligence Agency
CPI	Corruption Perceptions Index
CPIA	Country Policy and Institutional Assessment
CRE	Completely Random Errors
CU	Customs Union
EEC	European Economic Community
EFTA	European Free Trade Association
EFW	Economic Freedom of the World Database
FE	Fixed Effects
FI	Fraser Institute
FPE	Factor Price Equalization
FTA	Free Trade Agreement
GCS	World Economic Forum Global Competitiveness Survey
GDP	Gross Domestic Product
GLS	Generalized Least Squares

<i>GMM</i>	Generalized Method of Moments
<i>HOV</i>	Hecksher-Ohlin-Vanek
<i>ICRG</i>	International Country Risk Guide
<i>IMF</i>	International Monetary Fund
<i>IV</i>	Instrumental Variable
<i>KKZ</i>	Kaufmann- Kraay- Zoido- Lobatón
<i>LDC</i>	Least Developed Countries
<i>LSDV</i>	Least Squares with Dummy Variables
<i>MENA</i>	Middle East and North Africa
<i>NBER</i>	National Bureau of Economic Research
<i>NIE</i>	New Institutional Economics
<i>OECD</i>	Organization for Economic Cooperation and Development
<i>OLS</i>	Ordinary Least Squares
<i>PCA</i>	Principle Component Analysis
<i>PTA</i>	Preferential Trade Agreement
<i>R&D</i>	Research and Development
<i>RE</i>	Random Effects
<i>RTA</i>	Regional Trade Agreement
<i>TFP</i>	Total Factor Productivity
<i>TI</i>	Transparency International
<i>TWFE</i>	Two-Way Fixed Effects
<i>UN COMTRADE</i>	United Nations Commodity Trade Statistics Database
<i>UN DESA</i>	United Nations Department of Economic and Social
Affairs	
<i>UNCTAD</i>	United Nations Conference on Trade and Development

<i>WCR</i>	World Competitiveness Report
<i>WDI</i>	World Development Indicators
<i>WGI</i>	Worldwide Governance Indicators
<i>WTO</i>	World Trade Organization

1. INTRODUCTION

Institutions are counted among the most important factors of determining long-run economic performance. For centuries, they played a very crucial role in fostering growth, increasing welfare and sustaining social structures both in the Western and traditional societies. Whether conventional or modern, institutions and their reflections on governance elements are vital to understand the underlying mechanism of economic prosperity and development. Today, a vast body of literature on the role of institutions do exist both in the fields of economics and political science, primarily. The two are conceivably inter-related and there are mechanisms that provide the tools of mutual understanding. Public choice, for instance has emerged from such a logical foundation that intersects the realms of politics and economy.

One important note in the very beginning should be on the evolution of institutions and how tractable its measurement is in the empirical studies. Although the literature on institutions and the economic environment has a long history dating back to early 20th century, the practical measures to quantify them are created quite recently in the early 1980s. The basic approach taken on the nature of institutions in the dissertation is that institutions are structures with general forms that evolve in a long period of time while governance elements which are conceived as perceptions or reflections on the underlying institutions may change in a shorter time span. Governance indicators could be said to provide specific and observable aspects of the quality of institutions in an economy.

International trade on the other hand, is one of the fewest areas under the macroeconomic theory that has attracted many researchers who have sought to understand economic growth and welfare differentials across the globe. In its traditional sense (i.e. Ricardian framework), trade is assessed as a positive factor that fosters aggregate growth for the engaging parties. The channels through which it affects income level and its distribution among and within the countries however are subject to a prolonged debate. The factor returns and prices, the change in relative wages depending on the relative abundance of the production factors in tradable goods and net welfare impact of international trade have long been discussed in several theoretical and

empirical works. The impact of geography, climate, culture and demography is quite well examined in the literature initiated by the so-called “new trade theory” in early 1990s with a technical contribution which came from the “gravity equation” models since 1980s.

International trade literature has so far incorporated many elements from law of economics, economics of education (i.e. the effect of human capital formation) and health economics as well as economic geography and institutional economics. In order to provide an intuition on how trade dynamics work, the literature benefited heavily from geographical and demographic factors while the re-emergence of the role of institutions and governance led the way to a new line of research, mostly being empirical.

With the emergence of the literature on institutional economics and governance indicators however, this new line of research has turned green to provide further insight in to the international trade, growth and other macroeconomic aspects of the economies, especially in the long-run. The institutional basis for each country and the rules set-up accordingly is described as one of the many possible explanations for cross-country income level differences and the level of bilateral trade. The colonial and legal origins of the countries, their independence dates, together with other geographical and cultural aspects are now considered as crucial in understanding long-term international trade dynamics.

A significant amount of work has been carried out with the use of gravity equation so far; which basically assumes that bilateral or multi-lateral trade is reduced by resisting factors (i.e. barriers). Natural or by law, these barriers are incorporated within the gravity model and thus the level of trade is estimated in various studies. The so-called “border puzzle” which represents the factors that lead reduction in inter-state trade volume while increase in within state trade, is still in place. Thus, another implication of the dissertation is to provide some light on the possible determinants of the puzzle with the help of different institutional structures in the partner countries.

This dissertation has therefore adapted a perspective that merges the two bodies of literature in order to shed light on the dynamics of cross-border and bilateral trade volumes among countries, in specific. Given the relevance of gravity type equations in the current literature, the study has benefited very much of the model. As it incorporates both national accounts (i.e. Gross Domestic Product [GDP] levels) and other factors such as geography (i.e., distance and land structure), demography (i.e., population); the gravity model has already become a useful tool to reveal the dynamics of trade. Our argument in the dissertation is that the institutional variables, specifically the administrative quality signaling ones, are at least equally important as the geographical components of bilateral trade are. A critical attempt made by the dissertation is to provide empirical and intuitionnal rationales that assess the comparative roles of institutions which are proxied by governance indicators and geographical measures that presumably instrument trade patterns in some ways.

Therefore, leaving the discussions around their comparative effects on growth performances aside, we could easily conclude that governance elements are essential to foster bilateral and international trade by creating a more suitable and stable environment to pursue trade policies in specific. The level of corruption, bureaucratic and administrative quality and the enforcement of law (i.e. contracts) and order in a country are very much influential on the trade policies and in fact on the formation of institutional basis for tradesmen and investors in general. The empirical analysis seems to have left more room for further investigation of the border puzzle as it provides an inquiry on the possible role of institutional quality differences in explaining trade shares. Putting forward the argument that institutions are general phenomena rather than individualist patterns that manifest themselves as a complete set of social contracts, this study is yet another attempt to reveal the dynamics of trade, explained by a set of governance variables rather than individual governance indicators. The type of the relationship which is proposed and proven to be as governance indicators to be effective on trade dynamics is also consistent with the recent consensus in the literature that institutions are long-standing variables, compared to the temporarily changing policy variables (i.e. trade measures). The openness of a country which is measures as the proportion of total exports to the GDP in this dissertation is claimed to be partly

resulting from the institutional basis of the trading countries, which are proxied via governance indicators.

The outline of the dissertation is as follows: after this first chapter that provides an introduction; the first of the remaining three chapters is dedicated to the inter-links between the literature on institutions, trade and growth. Beginning with an overview of institutional paradigm that has evolved over the years, a comparative analysis of the neoclassical, new institutional and the more recent lines of institutional research follows this chapter. Last, the intersections of governance and trade literatures are emphasized. The importance of this dissertation manifests itself immediately after a brief overview of the existing literature since the effect of governance indicators on international trade is relatively less exhausted while a single indicator (corruption) is usually studied in occasional papers. The third chapter provides a general brief on the structure of the problem with special emphasis on the reasoning behind the analysis, along with an overview of technical details that stem from econometric methodology and discusses the results while the fourth and last chapter concludes. Overall, this dissertation underlines the importance of governance indicators in explaining the “border puzzle” in a way that it asserts the relevance of institutional similarities to gain the upper hand against geographical explanations of trade resistance between countries. Technological developments have also contributed this recently rising apprehension of the diminishing role of geographical elements in explaining trade creation or divergence. Relating to the governance on the other hand, this dissertation claims that the governance should be taken as an overall phenomenon that reflects itself in explaining trade differences among countries, rather than being individualist patterns. Therefore, corruption, administrative effectiveness, law enforcement and such indicators gain importance when assessed altogether while they could posit controversial results when taken individually.

2. THEORETICAL FRAMEWORK AND LITERATURE

2.1. On Institutions

It is quite a hard task to provide a comprehensive definition to the term “institution”. Although there is an increasing consensus on the importance of institutions in almost every dimension of social sciences, a common definition is far from being reached. As Nabli and Nugent (1989) rightly put forward, different authors provide different definitions to these structures and/or phenomena. To a certain extent however, there are elements agreed upon. In that sense, among the characteristics of institutions are: being i) organizational structures, ii) formal, iii) created at a specific time and place by a specific means, iv) embedded in other institutions and v) universal. Obviously, one may easily contend to these arguments by arguing the opposite in each case.

Ostrom (2005) takes the “action arena” in which the outcomes are determined via different forms of interactions by participants as the focal point of her analysis in approaching the institutions. Under a game-theoretic set-up, her analysis incorporates several “holons” in which the action area is the main actor with its participants and different action situations interplaying for potential outcomes. Among the exogenous variables which consist of biophysical/material conditions, community’s attributes and rule, the latter gains her utmost emphasis on since they are the most effective ones on determining the institutional base. Rules are sort of instructions while regulation is a subset of those rules under which they are still operative. If the rules become precepts, Ostrom (2005) states that they represent a moral behavior and social code when applies.

Institutions are defined as complexes of norms of behavior that persist over time; the rules of a society or of organizations that facilitate coordination among people also (Nabli and Nugent, 1989). Another definition by Hodgson (2006) suggests that institutions are systems of established and prevalent social rules that structure social interactions. Therefore, he adds that language, money, law, systems of weights and measures, table manners, and firms (thus organizations) are all considered as institutions (Hodgson, 2006). Regardless of how comprehensive is the definition of institutions,

there are however some basic common elements agreed upon. An important characteristic of institutions as implied by Ostrom (1986), for instance: there are rules and constraints which shape the nature of institutions. They are prescriptions commonly known and used by a set of participants (as indicated in above paragraph) to order repetitive, interdependent relationships. Prescriptions in that sense refer to which actions are required, prohibited or permitted. Nabli and Nugent (1989) however emphasize the importance of assessing these constraints as a configuration of rules rather than single rules separately. A second general characteristic of institutions is that they are able to govern over groups and individuals whether they accept them voluntarily or they are enforced to do so. Third is their predictability. The rules and constraints of institutions should be understood and conceived as applicable for future cases and to all people (Nabli and Nugent 1989; 1335).

A broad definition for institutions and the rules surrounding them should therefore be that they are a set of constraints which govern the behavioral relations among persons and groups while providing moral and legitimate grounds of social life. Whether they are formal organizations or informal norms of a society; or the written and acknowledged codes of market operations, there are institutional structures that embody rules and regulations that govern the bilateral and multilateral relationships. In a theoretical framework by Roland (2004), institutions are broadly classified into two categories, namely: the fast-moving and slow-moving institutions as he provides the example of culture, including values, beliefs, and social norms for slow-moving institutions and political institutions for fast-moving institutions. What Roland (2004) argues is that political institutions do not necessarily change often but can change very quickly. Regarding the interaction between slow-moving and fast-moving institutions on the other hand could shed some light on institutional change while demonstrating the difficulties of transplanting institutions into different historical and cultural contexts. Aysan (2007a) however provides a deeper understanding of institutions and the course of institutional change, indicating that institutions are the underlying causes or dynamics of certain policy variables which are often regarded as governance indicators. Therefore, in Aysan (2007a), governance indicators and institutions are not exact substitutes while the first being the latter's reflections or results. Still however, he

argues that the literature (even the one by the World Bank) has not gone into a clear distinction in between the two, especially in empirical studies.

The role of institutions in explaining the growth dynamics and differences across countries as well as among them is a prolonged debate. The basic question has always been on the rationale or the mechanism behind the income level differences among the countries. Beginning with the studies on European history and the cross-Atlantic relations, researchers of economic historians, old and new institutional economists and the macroeconomists in general have been in pursuit of highlighting the underpinnings of the differences in economic prosperity worldwide since then. North and Thomas (1970; 1973) for instance emphasize the important role of building efficient economic organizations during the early middle ages (from 900 to 1500 AD) and early modern ages (1500 to 1700 AD). As trade fosters and the reach of contractual agreements widens to include several actors, new institutional structures become necessary to create but not inevitably efficient in order to define, protect and enforce property rights. The same applies to fiscal policy making in the late middle ages since the rise of gunpowder empires and other technological frontiers force countries to enhance their institutional basis to meet these new challenges (North and Thomas, 1973).

The economic history point of view also takes brilliant picture of the role of institutions throughout centuries as Engerman and Sokoloff (1997) indicate that the main reason behind the success of the US and Canada, compared to the other New World (specifically Latin American) societies is the relevance of substantial differences in the degree of inequality in wealth, human capital and political power. Moreover, they propose that the roots of these disparities in the extent of inequality are inherent in differences in the initial factor endowments in respective colonies (Engerman and Sokoloff, 1997; 2005). With these, they mean the Latin American countries.

Despite the current literature on the history of economic integration, welfare creation and the structural basis of today's economic environment (i.e. markets), one can trace the arguments on the role of institutions (both rational and traditional, as still debated) back to Max Weber (1925; 1978) who wrote the *Wirtschaft und Gesellschaft*.

Although being a sociologist, Weber had significant contribution to the theory of economic and social organization that any other economic sociologist did in the early 20th century. Living in the same period with his Norwegian American colleague Thorstein Veblen, his contribution to the institutional and legal foundations on an economy is widely neglected by the mainstream economists. Though he repeatedly stated that his aim was far from presenting ideas on economic theory or replacing any, Weber's analysis included elements on the social or institutional structure of systems of economic activity. He could also be said to have perceived the variations among institutional bases under different cultural structures.

Given the new classical economists' indifference of the role of institutions; Weber's contribution gains utmost significance. Two basic convictions are laid under Weber's understanding of institutions: i) the institutional system of the Western World is not a *natural order* which emerged by only removing the confronted obstacles but rather a rationally shaped one that represents only "one of the several possible lines of social development" (Weber, 1978) and ii) institutions and other "social structures are inherently instable" (Weber, 1978). With respect to what Veblen (1899) proposed, Weber's ideas are considered to be less radical. Perhaps the most significant part of his analysis however was on the different types of legal and social legitimacy and authority as he praised the rational and legal basis of legitimacy in the formation of authority in a society, as opposed to traditional and charismatic forms.

The main line of evolutionary economics is however represented by Veblen (1898; 1899) who proposed a radically different sort of engagement to economic activities in a society. Since then the old institutionalist school remained relatively weaker, compared to the new classical economy's approach to the definition and functioning of institutions. The new institutional economics (NIE) on the other hand emerged to fill in the gaps of explaining the determinants, scope and the effects of institutions which were widely neglected by the new classical school. The new institutionalist school has adapted an approach to the issue that both tries to seek for the determinants and effects of the institutions and searches for applied cases to understand institutional diversity. Their basic difference than the new classical orthodoxy is to

introduce institutions as one of the key elements in determining long-run economic performance while they differ from the old institutional school in terms of methodology and tools when assessing their impact. A more quantitative and comparatively systematic approach dominates the first. The new wave also affected development studies as Stiglitz (1986) refers to a new theoretical framework for the least developed countries (LDCs), developing and developed ones, by flexing the neoclassical school's orthodox views on the issue. Stiglitz (1986) argues that institutions are not exogenous but rather endogenous while the change in the environment leads to a lagged change in the institutional structure. A comparative review of the two bodies of literature is provided in the succeeding section.

2.1.1. Old versus New Institutional Approaches

Following the line of research dates to Thorstein Veblen's (1899) significant work the role of institutions in shaping a society, institutional (or evolutionary) economics is now considered as one of the fundamental elements in the growth literature as well. In his remarkable article published in the *Quarterly Journal of Economics* (1898), Veblen argued that neoclassical economics did not possess the very substantial element of being a science as it was not evolutionary. The old institutionalist school, widely represented by Veblen, Ayres, Mitchell, Commons and Hamilton, introduced the most comprehensive framework on the role of institutions (and organizations) as they described any sort of institutions in a society as 'economic institutions' that carry the *men's interest in material means of life* (Veblen, 1898):

“This economic interest has counted for much in shaping the cultural growth of all communities. Primarily and not obviously, it has guided the formation, the cumulative growth, of that range of conventionalities and methods of life that are currently recognized as economic institutions; but the same interest has also pervaded the community's life and its cultural growth at points where the resulting structural features are not chiefly and most immediately of an economic bearing. The economic interest goes with men through life, and it goes with the race throughout its process of

cultural development. It affects the cultural structure at all points, so that all institutions may be said to be in some measure economic institutions.” (Veblen, 1898)

Veblen continued his criticism against the neoclassical economics as he defined the world of mainstream economics as static, hedonistic, and simplistic; while opposing the consumer theory based on the basic human instincts. Therefore, he called economics as non-evolutionary and unscientific. Schumpeter (2004) shared his views on the ‘static’ nature of economic analysis by the neoclassical orthodoxy while providing some intuition on the relevance of the undercurrent economic phenomena that evolve over time. Mitchell, Commons and several others including Galbraith took Veblen’s basic postulates forward and provided criticism over the neoclassical economic theory on fiscal and monetary grounds. Mitchell (1928) for instance criticized the role of money in the neoclassical school while Commons (1923 and 1931) questioned the assumption of full employment and the passive role of credit. Hamilton (1919) on the other hand launched harsh criticism over the neoclassical reliance on laissez faire. Galbraith (1958; 1998) for instance uses the term “conventional wisdom”, first coined by Veblen to refer the orthodox economic ideas that created his era’s conservative environment.

The term ‘institutionalism’ however was first introduced by Hamilton (1919) in an American Economic Association conference paper while it was Commons (1931) whoever first recognized the ‘institutional change’ phenomenon in the “old institutionalist” school. The institutional approach to economics gained much of its popularity between the two world wars while it faded away with the rise of Keynesian economics. It is very likely to have influence on the birth of the Keynesian revolution though. The role of institutions could be said to reappear as an important factor in describing the long-run growth dynamics after the failure of Keynesian economics while partially leading to behavioral economics after the 1980s.

The new institutional economics on the other hand was represented by Douglas North, Elinor Ostrom, Oliver Williamson and partly Ronald Coase who is also considered under the new classical orthodoxy in terms of assessing the institutions at microeconomic level (i.e. firm) with a property rights perspective (i.e. the relevance of

contracts). Among the new classical economics representatives, one should also cite Frank Knight (1921) who brought the theory of the firm forward as early as 1917, when he defended his doctoral dissertation. Often regarded as the founder of Chicago School of Economics, Knight (1921) is said to be highly influenced by the works of Max Weber as he also translated Weber's *General Economic History*.

Both the new and old institutionalists argue that the conventional neoclassical economics has long ignored the essential role of institutions and in fact they matter in shaping the economic behavior and the overall performance. It is however the rational economic behavior assumptions of the neoclassical approach that separates the new and old institutional schools. The focus of the old institutionalism was on the cultural environment that shaped the men's behavior while new institutionalism sheds light on the modified or extended version of the rational choice model of the standard neoclassical approach with a more explanatory data and explicit theoretical analysis.

As Rutherford (1995) puts it, the normative propositions of the old school gave place to the studies of positive analysis with the emergence of new institutional school. Koopmans (1947) for instance attacked the old institutional methodology on the grounds of lacking proper foundations in a theory of individual behavior and measurement without theory. Again, old institutionalists are criticized for introducing institutions without any theory while neoclassical school for having the necessary theoretical (micro-) foundations without any institution in it.

The new and old institutional schools have many aspects in common as they both provide a strong criticism of neoclassical economics for i) its negligence of institutions in its analysis, ii) the strong assumption of rational behavior in decision making, iii) its over emphasis on equilibrium and statics rather than disequilibrium and dynamics and iv) its rejection of any change in preferences or habits (Nabli and Nugent, 1989). Yet, the new institutional school provides a more positive critique of the mainstream economics, compared to that of the old institutional school. Both the old and new institutional schools share a broad scope of (market and social) institutions while the latter developing a more comprehensive set of tools with the first having a more radical approach to the main foundations of the neoclassical orthodoxy.

Another key divergence between the old and new institutionalists is that the first regard the development and the role of institutions as functions of social and political factors along with the economic reasoning while the latter only see institutions as a matter of efficiency and economizing the rational behavior (Rutherford, 1995). The new institutional school is an attempt to endogenize institutions within a neoclassical framework. The efficiency of institutions and therefore the lower cost of contracts are the key elements that would constitute economic development, according to North (1990) while changes in relative prices lead to creation of more efficient institutions which could be regarded as anomalies under the theoretical framework. North (1990) emphasizes the importance of ideology in creating institutional change. He argues that the existing institutions, both formal and informal, provide an incentive structure within which economic, political, and social organizations develop. The argument he brings forward is partly inherited by Acemoglu et al. (2005a) as they argue that the current institutional base in a country will have a profound impact on the next period's institutional construction. North (1990) however adds the ideological perspectives as a factor that affects the pace and direction of institutional change while arguing that some of the European countries lagged behind due to such ideological differences. He also cites the informal institutions, the role of property rights and the role of organizations as important elements of institutional change.

North's attempts are occasionally regarded as creating a bridge to fill the gap between the old and new institutionalists as he tries to link the culture, habits, path of dependence and the evolutionary process of learning to the standard partly deterministic and ideological framework (Rutherford, 1995). Veblen's (1899) proposition was that technological knowledge would lead to shifts in basic pattern of life and ultimately alterations in institutions and cultural norms while North (1990) proposed a combination of ideological base and the learning path in the direction and therefore success of institutional change. Veblen's point on the systematic failure of the business institutions on directing the private economic activity in ways consistent with the public interest and his harsh criticism over the business institutions that generate more of private income and create inefficient resource allocations in the society could well be applicable to the formation and the effects of interest groups (Rutherford, 2001).

2.1.2. Debating the New Institutional Paradigm and Beyond

The new institutional economics (NIE) mentioned in the previous sub-sections could be assessed as an extension or departure from the neoclassical economics. Given the absence of rational reasoning for the micro dynamics of the institutional structures grounded on the so-called class struggles in the Marxian literature, the NIE could well be said to provide the necessary underpinnings of the evolution of institutions in a society. The micro-foundations of the NIE have many similarities with the neoclassicals while they emphasize the importance of several organizational and institutional structures such as property rights, contract enforcement and transaction costs. There are two broad approaches under the NIE; namely, transaction and information costs on one hand and the theory of collective action on the other (Nabli and Nugent, 1989). As stated in Williamson (1985), institutions are regarded as cost-minimizing arrangements which are subject to change with respect to the changes in the nature and sources of transaction costs and the cost-minimizing means. Following the same line with the transaction and information costs theme, the second one, often represented by Alchian (1961), Coase (1960), Demsetz (1967) and Alchian and Demsetz (1972) tries to link the law and economics literature as it explains the rise of certain institutional mechanisms called property rights in the presence of externalities stemming from different technological and (economic) environmental conditions. Coase (1960) for instance, argues that in the absence of transaction costs, any sort of property right assignment could bring efficient contractual results by the means of bargaining and negotiations. Regardless the initial situation, he states, the most efficient result will be achieved through well-defined property rights and contract enforcement. Regarding the transactions cost and property rights, the neoclassical framework could be summarized as follows:

On Transactions Cost

The transactions cost approach to property rights was introduced by Coase (1960) in a world of government control over most of the sectors in the US economy,

and even anywhere else in relatively developed world. Coase (1960) describes this world as being designed to bring about government control of the operations of the industry as a whole, specifically on the communications sector. In a costless transactions world he assumes, the price mechanism will make the property rights allocation efficiently. Whatever the initial conditions in the market and the positions of the parties, the resulting property rights allocation will be independent and same in all situations. Both the harmed and harming sides will tend to bargain on the current conditions and this allows the deadweight loss to be minimized. On the other hand, he shows that the court decisions (or government regulations) would not supersede the bargaining between the parties, thus there is still some room for it. The allocation of resources is to be optimal whether the damaging party has to pay for it. In the long-run it has no effect on allocation of resources. He ends up with the conclusion that “it is necessary to know whether the damaging business is liable or not for damage caused since without the establishment of this initial delimitation of rights there can be no market transactions to transfer and recombine them.” According to Coase (1960), the ultimate result (which maximizes the value of production) is independent of the legal position if the pricing mechanism is assumed to work costless.

In a real world, of course the transactions are not costless. Regarding the agreement terms, there may be many costs. One most possible one is the documentation and paper bureaucracy costs. Although he admits that the market pricing mechanism is not costless, he claims that as long as these costs are low enough transactions continue to occur since it will be still profitable for both of the parties. The increase in the value of production should be greater than the costs which would be involved in bringing it about. So now the initial delimitation of legal rights established by the legal system has importance on lowering such costs to continue the business. He then introduces the firm as an alternative organization for lowering such costs and thus bargaining between individuals is eliminated by administrative decision. He then argues that the administrative costs of organizing a transaction through a firm is not inevitably less than the costs of the market transactions. The type of contracts made is important since long-term contracts have lower costs. Going further he also discusses the government as a “super-firm” to do the administration for such transactions. Since it has the biggest

power among the institutions to influence the factors of production by its administrative decision, the government may imply somehow lower costs at certain matters. He argues that as the problem involves bigger majority of the population so gets a social concern, the government regulation may result with efficient economic implications. However for the small interest groups, the government does not necessarily behave appropriately.

Coase (1960) proposes the market pricing mechanism (highest bidder rule, in most of the cases) to have self-regulation. He asserts that employing price mechanism would allocate resources to users without the need for government regulation. He proposes a well-defined property rights creation in order to avoid market failures. In order to increase the competition in such sectors he says, there should be some limitations supplied by the property rights organizations. As he again includes the costs of market operations to his analysis, Coase (1960) states if those were too high to make transactions then there should be some malallocation of resources by a regulatory organ. One important result he derives is that implementation of property rights would be much easier and less costly whenever the size of the population gets bigger to make transactions possible and/or the economic rents involved in the problem is lower. In this light, he gives the commercial users of the broadcasting industry example since they use a small proportion of “spectrum space”. He argues that the governmental departments also will be forced to use the resources in a more efficient way since they will have to pay for the service they use in a freely operating price mechanism. Such a pricing mechanism would allow positive revenues to the government.

On Property Rights

Coase (1960) made his point of property rights argument on the basis of efficient allocation problem and the inefficiency arising with the government regulation in any industry. Starting with the analysis of deadweight loss from transfers made, Becker (1983) already treats the transactions as non-costless. Coase (1960) is found to be consistent with Becker’s model regarding the optimal cost of transfers to be possible. If the deadweight loss from the transfer is higher than the relative gains from the

transaction as a whole, this transfer is then unlikely to occur. One similar point in both Coase (1960) and Becker (1983) is the marginal principle which implies the marginal impact of the expenditures on pressure to be greater than zero. The greater the pressure group size the less effective the expenditure on lobbying since the amount really gets bigger after a certain point. Per unit expenditure of a pressure group affects the amount of the aggregate amount to be redistributed in a positive direction. However this raises the amount of tax to be raised thus increasing the deadweight costs.

According to Becker's model; if the deadweight costs increase then the equilibrium level of subsidy decreases. So, this implies that on a menu of policies, those with lowest deadweight costs are more likely in equilibrium. Equilibrium implies that there is no less costlier way of transfers which is a result that Coase (1960) derives under the initial delimitation of property rights and a freely operating price mechanism conditions. One important result that Becker shows is that the successful groups tend to be the small ones, implying the lower costs of organization and other procedures. As a conclusion, both Coase (1960) and Becker (1983) reaches the result that efficient pricing mechanism will generate an optimal equilibrium condition in which the costs are minimized and regardless of the initial condition, the allocation of resources will be the same because of efficient bargaining and organizational structures. However, the property rights should be created on a sound basis first.

On Government and Regulation

For the government, Coase's stand point is the role of a special type of regulation in certain cases. However, this should be limited because once the rights of potential users have been determined initially; the rearrangement of rights could be left to the market. Government only should be intervening in order to provide low costs of transactions in the market. Depending on government would allow the political influences to get involved in the regulation process. At this point, Coase refers a mixture of transferable rights plus regulation. He treats the intangible goods as tangible ones like land, labor or capital. Coase (1960) could be said to have a positive and

empirical position in the argument. Since he regards the economic implications of transactions and regulation process as the core point in his analysis with using empirical examples of court decisions, the position he has is clearer.

In all the positive theories of regulation introduced by Stigler (1971), further developed by Peltzman (1976), Posner (1980) and Becker (1983), the gap between the regulatory decisive bodies and the economic implementations is seemingly filled. The important factor that is seemingly absent in Kahn's (1988) analysis is the political incentives and decisions of the regulatory organs in the government. The questions rather than economic, are almost all political although economically driven. The amount of regulation, the firms' costs and/or benefits from the regulation, the impact on consumers and the whole society and the political influence between groups are important factors determining the resulted equilibrium in the economy since regulation indirectly means a transfer of resources.

Stigler (1971) examines the demand and supply of regulation and cost/benefit analysis regarding the industry. One of the favors that regulatory body can do for the industry is the limitation on entry which Kahn (1988) also describes as one of the conditions for having a regulated industry. Here, according to Stigler political benefits and limits come into play. Political decisions do not necessarily reflect the majority voters' position sometimes even though the politicians have to maximize the votes subject to the constraint of total economic rents to be redistributed. He mentions the information, education and most importantly the organization costs for the lobbying group and in overall the cost of gaining the interest from regulation. Stigler treats political parties as natural monopolies through which the regulatory decisions are given. Stigler's analysis seemingly gives much of the emphasis on the relative group size.

After making a summary of Stigler's analysis, Peltzman (1976) states that the lower the group size the higher the per member gains from lobbying and the more likely to get the regulatory favors. Now the regulator's choice is not limited to the interest group size only but also the cost/benefit structure to be selected. If the consumer groups are large in size and inelastic in demand, then most likely the winning group will be the firms. In this sense, the political party should increase his probability of support from

these competing groups. As the lobbying becomes less costly by an advanced technology, then the amount of tax to be imposed could get smaller. Thus, this will make the amount to be redistributed smaller too. The profit hill that is generated by the regulation should be in equilibrium with the majority.

The political decision should create equilibrium at the lowest deadweight cost of transfers. This argument comes from Becker (1983) which is consistent with Kahn's (1988) arguments that if the regulation that maintains the natural monopoly is less efficient and much costlier, then simply we should employ competition and market price mechanism. To conclude, it may be asserted that the positive theories of regulation introduced by all these economists and the empirical evidences from Kahn (1988) and them just fit well and fill the normative decisive unit in the analysis. The political organization is unique in the sense that it creates or not a natural monopoly regarding both decision and regulation processes. The competition to acquire the benefits of regulation should create an optimal equilibrium of total welfare for the whole society. The need for regulation should be analyzed in details taking the product itself (i.e. the "nature"), the industry's conditions and the consumers' benefits.

The general "agency" or "principal-agent" problem together with the moral hazard and monitoring discussions however has prevailed both in the transaction/information costs and property rights themes as acknowledged by the works of Akerlof (1970), Jensen and Meckling (1976) and Williamson (1979; 1985) which apply the potential issues to managerial behavior and ownership of firms. The second general approach is the collective action and the elimination of "free-rider" problem. The theory of collective action provides intuitive methodology to approach the issue of public goods and externalities not only in tangible ones (i.e. pollution) but also abstract ones (i.e. tariff rates). The general incentive to free ride is first analyzed by Olson (1965) and Hardin (1968). The factors such as group size, age, homogeneity and purpose are determinants of success in Olson's (1965, 1982) works that in turn yields the desired result in terms of policy-making via lobbying. Hardin (1968) on the other hand discusses the "tragedy of commons" in which he assesses the overuse or congestion in the use of public goods, creating problems in the absence of well-

structured property rights. The neoclassical (and partly the new institutional economics') theories on the formation of groups to eliminate potential free-riding issues and provide efficient monitoring have evolved in time to create a vast body of literature on the effects of pressure groups for gaining political power. Needless to say that the policy-making institutions are operating in such an environment shaped by the type, number and the size of such organized groups, to some extent at least. A brief review of the theory of interest group formation is provided below:

Emergence of political, economic or other social action groups deserves a multi-dimensional approach for analysis since it has micro and macro foundations at the same time. In an effort to understand the formation process and the structure of interest groups, Olson's (1965) pioneering work; *The Logic of Collective Action* should be counted with Buchanan's (1965) leading paper on the *Economic Theory of Clubs* in order to provide some insight at structural level. In his dissertation thesis, Olson (1965) makes use of the basic postulates for individual action that presumes self-interest maximizing behavior while answering the question of interest group structures in a society. Accordingly, a successful and prolonged interest group should be smaller in size yielding positive gains for its members that is the group actions to create an average level of benefits exceeding the costs. The problem of 'free-riding' however may emerge under the condition that there is no *selective incentive*. The larger the group size, the more the number of "free-riders", implies the theory. This is mostly due to the misalignment of interests among the group members and the very trivial share of average benefit to the members in a very large group. Therefore, Olson (1982) argues that smaller the group size, effective and successful is the lobbying activity. The same is argued within the theory of clubs, by Buchanan (1965), who puts forward the conclusion that given the set of adjustable property rights, the optimal group size tends to be smaller when the average real income increases. Such a mechanism however would only work if the goods provided by the group (i.e. privileges) are considered as exclusive in order to avoid the "free-rider" problem seen very common in public good provision. *Selective incentives*, as Olson (1982) puts it are not always positive but sometimes occur at negative margins such as being excluded from the "club".

Therefore, overall are five basic conditions for the formation and success of an interest group, according to Olson's (1982) theory:

- i) Positive gains from lobbying
- ii) Existence of selective incentives
- iii) Exclusive goods (i.e. perfect market information on the specific good) that create negative and/or positive externalities
- iv) Homogeneity of the group members/ alignment of interests
- v) Existence of property rights regime or low cost of bargaining for collective action

Olson's (1965, 1982); Buchanan's (1965); Peltzman (1976) and Becker's (1983) arguments all point the theoretical fact that the smaller the size of and the bigger is the net benefit to the pressure group, the more incentive that the individual has in joining and contributing the group.

Olson (1982) argues that there will be no countries that attain symmetrical organization of all groups with a common interest and thereby attain optimal outcomes through comprehensive bargaining. Relatively more stable countries will tend to create more organizations for collective action over time while members of 'small' groups have incredibly higher organizational power, lowering the costs while that power is to diminish over time. And last not the least, he argues that emergence and persistence of such interest groups overall reduces efficiency and aggregate income in the society since they are divisive in nature. Two basic points that both Tullock (1983) and North (1983) pay attention are: testing and refutability of Olson's theoretical and semi-empirical conclusions in a wider range of countries; and the position of the 'statecraft' as the main interest group.

As Olson (1982) states, the theories of social classes and rigidities effective on relative growth are debatable and the empirical facts vary over time and country whether they are in line with the theories or not. Possibility of multi-causal cases is yet another concern regarding the relationship between growth and interest groups. Last not the least, problem of testing is important as multi-causal diversity may imply the same

empirical result while having different reasoning and interpretations. Murphy et al. (1991) however provide a different perspective on how easy a rent-seeking society could develop interest groups; and conclude that rent-seeking activity is subject to very natural increasing returns, thus having more returns at higher levels. Accordingly, it could afflict innovative activity in the society and therefore hinder economic growth.

Following the above brief on neoclassical arguments on interest groups shaping the policy-making environment, we should state that the theories of transactions/information cost, property rights and government regulation have much in common or many interferences with the theory of collective action or interest group formation. Both approaches under the NIE have either complementarities, as stated by Nabli and Nugent (1989), as the theory of collective action might provide rules for setting up well-defined property rights and the actions taken by the pressure groups in an economy might well induce the legal and normative basis for such regulations or rules in several ways. In North (1990) for instance, institutions defined as creation of human beings with an evolving nature in time and place are envisioned as the underlying rules rather than the strategy of the players. He argues that a “choice theoretic” approach is essential to begin with the analysis of institutional change. Almost any organization in a society (i.e. political structures, social and economic bodies) is a group of individuals with existing incentives, opportunity sets, skills and human cooperation needs etc. (North, 1990).

According to North (1990), organizations are sort of responses to the institutional structure in the societies while arguing that the organization behavior or their actions are the primary causes of alterations in a broader institutional base. He calls an “institution as any form of constraint that human beings devise to shape action” (North, 1990), as he includes formal constraints such as rules (of law) or informal constraints, such as conventions or norms in a society. Institutions are argued to have impact on reducing transaction costs and eliminate various forms of market uncertainty along with the information costs. They are also regarded as important monitoring tools for better enforcing the agreements or contracts. Therefore, North (1990) and Williamson (1985) argue that “economic institutions, such as firms, are created to

organize a process of pulling back from the open market to ‘internalize’ certain transaction forms to help coping with such problems.”

It is still debatable however, whether the good institutions (i.e. democracy) work fine for the country-specific examples in the long-run. As Gunnar Myrdal (1957) puts it, the economic activities of the colonialists represented a measure of spread of economic expansion which without peculiar power relations of colonialism would not have taken place. It is however not certain whether the ideal and ideological elements of the colonizers were effective in achieving the development goal in the colonized country, according to Myrdal, who gives the examples of Thailand which enjoyed its independence and democracy and Burma which was strictly dependent for a prolonged time.

Here the debate around the root causes of good or bad institutions comes into the discussion carried out so far. Given the historical examples, institutions do not always evolve efficiently under such circumstances: i) the relatively better institutional elements might have been already eliminated from the feasible set by the historical precedent which in turn affects the subsequent periods; ii) besides the lack of necessary knowledge on the efficient institutions in a society the status quo might well be accepted by the people without any questioning; and iii) even if the institutional base is clearly inefficient, people might not have the tendency towards changing it as long as the “establishment” makes certain groups better off or at least not worse off. Following a similar logic with that of Myrdal (1957), North (1990) puts the opportunity set created by good or bad institutions as the necessary but not sufficient condition for long-term economic success. Whether such areas of opportunity are created via inefficient and often unequally designed institutional structures or vice versa, individuals and nations that take advantage of that window achieve economic progress (North, 1990).

As Williamson (2005a) states, governance is largely associated with such policies and organizations. The economics of governance accordingly becomes the study of good order and workable transactions. That field helped economists to be persuaded that institutions do matter, adaptation to disturbances is a crucial purpose of economic organization, micro analytics (i.e. theory of firm) matter, and positive

transaction costs could be addressed in a comparative way where there are opportunities of internalization, and public policy should be guided with a complex set of contracts and economic organizations which tend to lead efficiency. Adaptation, governance and transaction costs are the key elements in the economics of governance, according to Williamson (2005b).

Institutions became one of the focal points in explaining growth differences in the long-run since early 2000s, after the whole course of 1990s which witnessed the rise of international trade, technology, geography, and culture as the primary elements of endogenous growth literature inspired by Schumpeterian creative destruction notion. One definition of institutions made by Nelson and Sampat (2001) for instance, regards institutions as standard “social technologies” as they indicate that economic growth stems from the co-evolution of physical and social technologies.

The key point in the role that institutions play as internalizing structures is their relationship with the policies. Nevertheless, the distinction between policies and institutions arises when the causality between the two is discussed and a comparison in terms of explaining growth is made. The two factors in explaining growth, namely institutions and policies are closely related, with the first being more relevant, as stated by Acemoglu et al. (2005a) while there are contrary examples to such an argument. As a key conclusion of the study by Easterly and Levine (2001) for instance, national policies are argued as being closely associated with long-run economic growth rates. Rather than the growth rates or growth paths of countries in a panel data analysis, Easterly and Levine (2001) find that factor accumulation is persistent over time. A panel data set of 73 countries over the time period between 1960 and 1995 is constructed to see the effects of trade openness, human capital, macroeconomic indicators and policies along with other indicators on per capita GDP growth; they conclude that there are evidences of conditional convergence, in the human capital, for instance. National policies on the other hand are estimated to have long-run growth effects, in an endogenous productivity growth model. Higher black market exchange rate premium has a negative impact on growth while international trade seems to have a positive effect on growth. Large governmental size is impeding economic growth while

the regressions suggest there is a negative link between inflation and economic performance. Financial development is also somewhat positively associated with economic growth although there are counter-evidences in the literature. Since the growth performance over time is highly variable, unlike the factor accumulation, Easterly and Levine (2001) describe the role of ‘something else’ as policies which are strongly linked with long-run economic growth rates.

In Easterly and Levine (2003) however, they test the endowment, institution and policy views of inducing growth against each other in order to provide an intuition on whether economic development depends on geographic endowments like temperate instead of tropical location or these endowments of tropics, germs and crops affect economic development only through institutions or policies. What they find is that geographical environment affects development through institutions while stating that there is no evidence for geography affecting development directly or through policies (Easterly and Levine, 2003).

In another paper, Easterly et al. (2006) argue that social cohesion (i.e. income inequality and ethnic fractionalization) endogenously determine the institutional quality and effect growth performance in turn. Providing the measures of social cohesion in the literature as direct and indirect, Easterly et al. (2006) put them in an order as follows: membership rates of organizations and civic participation, measures of trust (from the World Value Survey) as direct measures and income distribution measures (such as GINI), ethnic heterogeneity measures as indirect measures of social cohesion. Following the same sense in Easterly and Levine (2001), Easterly et al. (2006) also underline the importance of appropriate national policies to reduce social cohesion or fractionalization in the society to build up better institutions that yield more of economic growth. Governance emerges as a key element in defining the ‘right’ policies or providing a ‘good’ institutional base.

One of the most significant discussions on the relative effects of institutions versus national policies on growth and development is from Easterly (2005), where he runs several regressions, including estimations with dynamic panel data, concludes that macroeconomic policies do not yield good explanatory results, once he controls for

institutions. Either holding the macroeconomic variables exogenous or endogenous yield the same result that they do not enter into the regression as significant factors of explaining the income differences among countries, according to the empirical evidences, he asserts. Easterly (2005) however speculates on the adverse macroeconomic policies and macroeconomic volatility in general to be proxying for poor institutions in growth regressions as in sum he states, it is difficult to discern long-run effects of policies on development when one controls for institutions.

Among several other standing points, a view on the institutional basis for a successful government comes from Besley and Kudamatsu (2008) who search for the relevant conditions for good performance in economic terms. Analyzing the conditions for good or bad autocracies in terms of the forces that shape accountability in the absence of elections, Besley and Kudamatsu (2008) state that the decision of citizens from a ruling “group” being the selectorate for the leader’s fate is important while the higher the turnover rate is under an autocracy, better is the economic performance. The existence of democracy and its institutions is still preferred over a “good” autocracy in their model; however Besley and Kudamatsu’s (2008) contribution to the literature takes the debate around the possible merits of installation of a “benevolent dictator”, compared to those of competitive market forces.

When it comes to the literature on institutions, Acemoglu and his colleagues’ contributions clearly dominate over any other theoretical or empirical study. Acemoglu et al. (2002) for instance test the connection between initial population density, urbanization, and the creation of good economic institutions. They show that, other things being equal, the higher the population density or the greater the initial urbanization, the worse the subsequent institutions, including the ones both after independence and after. Accordingly, relatively densely settled and highly urbanized colonies ended up with worse or extractive institutions while relatively sparsely-settled and non-urbanized areas received an influx of European migrants and developed property rights protective institutions. What they call the “reversal of fortune” therefore becomes clear that institutional reversal led the previously richer and more-densely settled places ending up with worse institutions (Acemoglu et al. [2002]).

In one of their most-celebrated papers, Acemoglu et al. (2001), they provide a setup where European settlements as a function of diseases and mortality affect the level of long-run development in once-colonized countries. They make use of initial conditions in European colonies, specifically data on mortality rates faced by Europeans and find a very strong relationship between the historical mortality risk faced by the Europeans and the current extent to which property rights are enforced. Using the mortality rate as an instrument for the current enforcement of property rights, Acemoglu et al. (2001) demonstrate that today's income level gap between rich and poor countries is due to economic institutions. More precisely, they search for the existence of expropriation risk in a colony and they find that the security of property rights almost accounts for all the income level differences among colonies.

Acemoglu et al. (2001) reach to the conclusion that the high correlation between geographical variables such as latitude and income per capita is stemming from the fact that European settlers tended to locate at moderate climates rather than tropical ones. They also indicate that once controlling for the effects of economic institutions, none of the variables such as the identity of colonial power, contemporary fractions of Europeans in the population, or the proportions of the populations by religions are significant determinants of income per capita. Last, Acemoglu et al. (2001) implies that instead of geographical, religious or cultural effects, economic institutions appear to be robust casual factor underlying differences in per capita income levels across countries.

Acemoglu et al. (2005a) on the other hand provide a comprehensive overview of the institutions literature with comparative analysis of other growth determinants, such as geography and culture. The basic motivation of their paper is to search for deeper causes, or the fundamental determinants of economic growth, rather than the presumptions of neoclassical growth model and its modern extensions. What they pursue is to determine whether the role of institutions is greater than other explanatory variables in the (endogenous) growth literature. They find that institutions prevail for long periods and are subject to change in close relation to the policies. Any policy change is closely related to institutional base while an institutional change is closely related to shifts in policies. Therefore, they assert that economic institutions are affected

by the political sphere and vice versa. Beyond the market institutions and other key variables such as property rights, they seek for further answers to the income differences among countries as they provide some natural experiments on the (European) colonialist and Korean experiences to understand the long-run effects of institutions. What they conclude that institutions are far better in –compared to geography or culture- explaining the variations in incomes among different set of countries. They emphasize that a theory of explaining the differences in economic institutions among different countries should be based on politics, on the formation and structure of political power, and the nature of political institutions.

Acemoglu et al. (2005a) however state that there is no full-coverage formal model yet for explaining the role of institutions on determining the growth rate(s), despite some of the earlier work by Acemoglu et al. (2001; 2002) partly provide some formal structures. Therefore, they seek for a more formal and mathematical model for the effects of institutions on income differences while reducing the weight of verbal arguments. Another future study should include the search for understanding the dynamics and mechanisms of persistence in institutional structures. They also ask for providing a dynamic equilibrium model under which institutional persistence and institutional change take place together. Finally, they argue that the role of policy and interventions in institutional equilibrium should be searched. A convincing fundamental theory of comparative growth, based on institutions is expected to yield a fruitful result in revealing the ‘deep causes’ of income differences, accordingly.

The long-run effects of institutions are increasingly at the center of the institutional economics literature. Rodrik (1999) for instance shows that countries lacking institutions to manage social conflict suffered even more dramatic declines in output levels during the oil shocks of the 1970s. Moreover, the colonial past and the inherited institutions as well as the geographical and cultural elements that affect the pace and direction of institutional change emerged as primary motives of explaining the institutional roots of economic development and growth. Acemoglu and Johnson (2005b) refer to property rights institutions and contracting institutions as two broad categories as they assess the long colonial history. They find that the property rights

institutions have the first-order effect on long-run economic growth, investment and financial development while contracting institutions are only effective in the form of financial intermediation.

2.2. On International Trade

As one of the most significant driving forces of globalization process in today's world, international trade has played a very crucial role in making of the world's total economy. Although it is still debated on the level of economic integration and the impact of trade in different countries, economic history point of view could be said to argue that a significant amount of globalization process were already in place during the 19th century (O'Rourke and Williamson, 1994; 2000). Besides the welfare-increasing effects of the globalized world environment, international institutions that reflect it (i.e. FTAs and PTAs) are also regarded as significant factors that reduce export volatility across the world (see: Rose, 2003 and Mansfield and Reinhardt, 2008).

International trade is almost undisputedly regarded as one of the leading factors of economic fostering and global integration. It is argued that trade has an impact on a country in many dimensions. Countries experiencing trade liberalization face with different aspects and results of bilateral and international trade. Since David Ricardo's dynamic two-good production model proved that trade is to benefit one group within the country in expense of a decrease in the other's welfare, the association of growth and the continual changes in relative prices of final goods and the impact of trade on growth and terms of trade have been questioned. The relationship between trade and income levels and convergence across countries in terms of per capita income have been intensively discussed in reference with total factor productivities and specifically technology differences as well as factor accumulation.

Under the domination of Heckscher-Ohlin and Vanek (1968) [H-O and H-O-V] model in international trade theory, based on simple two good-two factor-two country (2*2*2) world and then within an extended framework, the differences in wage premiums and resulting differences across sectors within countries are tried to be

explained by standard Stolper-Samuelson (see; Samuelson and Stolper [1941]) and Rybczynski (1955) effects. Being the first attempt to demonstrate the H-O theorem in a two-good, two-factor (capital and labor) and two-country model, Samuelson and Stolper's (1941) paper has important policy-related conclusions. Accordingly, the relatively abundant factor in a country and thus the good that intensively makes use of it in production process are the winners while the relatively scarce factor along with the good produced with it are the losers of free trade, not in absolute but in real terms of course.

Samuelson's another main contribution to the theory of international trade is the so-called factor price equalization (FPE) theorem. In his 1948 paper, Samuelson indicates that free trade would equalize relative prices of various goods, depending on their costs, which in turn pressures the factor returns or prices to equalize. He also demonstrated the conditions under which trade in goods would fully substitute for trade in factors themselves. For years, the FPE was assumed to be holding for generalized models and empirical analyzes. However, factor price equalization has turned out not to be the case since the trading countries might not be in the same cone of diversification. The differences in the factor endowments and technological levels among countries lead inequalities in factor prices (i.e. wages) which in turn affect income differences, the magnitude of convergence or divergence in income and growth levels and measure of inequality in countries. Several theoretical and empirical work showing how H-O-V model fails to explain differences in incomes, thus growth in economies have been introduced since then.

Helpman (1984) for instance, argues that the common predictions of the factor content of trade flows –which are based on the observable data relevant for empirical studies, have unnecessarily restrictive assumptions such as homothetic and identical preferences across countries and factor price equalization. When factor price equalization is given however, Helpman (1984) states that homothetic preferences become necessary to assume. In sum, he concludes that in the presence of factor price equalization, factor content of bilateral trade flows could be formulated in terms of differences in autarky relative factor rewards and differences in autarky relative factor

prices; while in the absence of factor price equalization, Helpman (1984) argues that factor content of bilateral trade patterns could be predicted from post-trade data without restrictions on preferences. Therefore, these predictions become useful tests of factor proportions (Heckscher-Ohlin) trade theory as they are applicable to cases where external effects such as industry spillovers do exist.

Other side of the discussion on the effects of trade on growth and economic welfare implies that the policies depending on the relative country size and economic power, such as being a monopoly, would also be highly important. Again a historical point of view by O'Rourke (2001) states that the role of economic integration via trade had different effects on the New World as it became more unequal compared to the Old World in the late 19th century. Trade policies complemented by redistributive elements (Alesina and Rodrik, 1994) are significantly important to create an economically and socially sustainable environment both at national and global levels. Venables (2005) for instance show that the spatial inequality in developing countries is due to the natural advantages of some regions relative to others and to the presence of agglomeration forces. His model demonstrates that the presence of increasing returns to scale in cities leads to urban structures that are not optimally sized. The location of activity effects the economy to become outward oriented, Venables (2005) concludes. This argument seems to be controversial to that of Krugman (1999) which shows that the nature of geographic environment could be altered to some extent by external factors.

Optimal policies such as tariffs in international trade were given emphasis when Bhagwati (1958 and 1969) analyzed the paradoxical case of "immiserizing growth", in which the country with a monopoly power in trade may face with large welfare losses due to the deterioration in terms of trade outweighing the gains from growth fostered by increased production. For the country that has no monopoly power, imposing restrictive tariff rates also generates the possibility of immiserizing growth. Avoiding such a possible result requires either some policy changes regarding tariffs and other restrictive measures or some taxation-subsidy mechanism that eliminates wage differentials. Such arguments are all related in some way to the institutional and organizational base in a country.

Trade theory has evolved through the past two centuries since the introduction of Adam Smith and David Ricardo, followed by Heckscher and Ohlin. Following the same line of research, Samuelson (1948; 1949), Leontief (1953; 1956), Jones (1956), Balassa (1961), Bhagwati (1972), Leamer (1980), Trefler (1993), Choi and Krishna (2004) and several others sought to understand the factor-price dynamics, welfare effects and the redistributive implications of international trade. Within the last two decades of the 20th century however, a new line of research has emerged, consistently with the re-emergence of growth and development literature. Inherently assuming the Schumpeterian creative destruction notion along with Adam Smith's increasing returns arguments, researchers aimed at analyzing the potential factors that either foster or hinder international trade, and growth. As provided in the above debate on the emergence of new institutional economics, trade literature has also neglected the importance of institutional basis for years. Few out of a great body of literature are devoted to understand the role of institutional environment or governance in international trade and thus income differences among countries. Theoretical studies like Grossman and Helpman (1994) or Feenstra (2004) have tried to fill this gap with policy-making tools and intermediate goods production approach through diffusion of knowledge and other factors by engaging in international trade. After a brief review on the evolution of scholarly studies on international trade, below three sub-sections are provided to reflect the later direction of trade theory and empirics.

2.2.1. Foundations of New Trade Theory

Although one can trace back further, to general consensus, the new trade theory which was stimulated by the ideas of Samuelson (1948, 1949) who first pointed out the “melting iceberg” proposition in trade, began with Krugman's (1991) groundbreaking paper who reconsidered the “iceberg” issue. Developing a simple model of economic geography, Krugman (1991) showed how a country might become an industrialized “core” or an agricultural “periphery”. Taking the approach very similar to that of Anderson's (1979) gravity model; Krugman proposes that firms usually tend to locate their production facilities closer to geographies with larger demand to utilize the

economies of scale through minimization of transportation costs. He concludes that emergence of a differentiation between core and periphery depends on transportation costs, economies of scale and the share of manufacturing in national income. In a more recent work, Krugman (1999) discusses the two conflicting views of geography as the first one implying the role of geography static with inherent features and the second one that argues similar locations might end up with different economic roles depending upon the tension between forward and backward linkages in production and increasing returns in transportation; and elements such as factor immobility and land rents. The two, therefore might result in very different economic organizations with different efficiency levels, Krugman (1999) argues. As he concludes, geography may have been a destiny in the past while it need not be in the future.

Since then, a new wave of theory with geographical foundations has emerged in international trade literature which was later coined as the “new trade theory”. Being a crucial element of the new trade theory, geography (including other aspects of the nature) has played a significant role in understanding the differences in trade shares whether bilateral or multilateral. Assessing the “increasing returns revolution” in trade and geography, Krugman (2009) provides a brief review of the new trade theory literature as he states that initially the theory seemed to be consisting of a series of special-purpose, incompatible models while it turned out that it would constitute a very fruitful ground for almost all models. Krugman (2009) further attempts to create what he calls as the “model of the model” in order to demonstrate the new economic geography in a cheat model to get some intuition about the home market effect.

Constituting the basis for a vast body of empirical literature in international trade, the gravity equation needs to be paid attention, at least shortly. Beginning with the theoretical foundations laid down by Anderson (1979), gravity-type models have become increasingly popular and common in empirical studies whether they are investigating the determinants of bilateral trade or comparative income and growth differences among countries. Having incorporating geographical, cultural or institutional elements however, the gravity equation could be said to have extended very much to involve almost any factor that is effective on trade.

Anderson (1979) provides a theoretical explanation for the gravity equation which is in use for more than half a century now. Beginning with the example of border taxes to be meaningless in a gravity setting because of its “unidentified” properties since they are considered as policy instruments for trade-flow distortions, Anderson (1979) argues that much of the instruments used in standard gravity equation are groundless, at least in theoretical underpinnings. Therefore, based on the pure expenditure system model, under a Cobb-Douglas setting, he builds up the simplest gravity model. Followed by the trade-share-expenditure system model, he changes the assumptions of identical expenditure shares on the importer and exporter countries along with the gravity equation income elasticities of unity, by introducing policy induced price differences under a constant-elasticity-of-substitution (CES) production function format. With additional variables such as income and population, he shows that gravity equation is still functional in an environment of multi-goods, tariffs and distance elements.

In search of theoretical determination of bilateral trade in a series of paper, Bergstrand (1985) makes use of CES preferences over Armington-differentiated goods (also see, Anderson and Yotov [2009]) to derive a reduced-form equation for bilateral trade including price indices. His empirical tests provided support for the assumption that goods are not perfect substitutes and imports are closer substitutes for each other than for domestic goods. Deardorff (1998) adds up a new dimension in this line of research by “properly” considering the Heckscher-Ohlin model to derive a similarly simple gravity equation both frictionless and with impeded trade.

Though well-positioned at the intersect of interest groups and rent seeking literature and international trade; last to mention in this section is Grossman and Helpman (1994), which argue regarding the trade policies that the government might choose a non-distortionary way by direct transfers of funds to one group. This line of research has opened way to discuss the role of political and institutional environment in determination of trade policies. A more detailed discussion of their model will be provided in the section on governance and trade literature.

2.2.2. Theoretical Literature

The focus on trade in explaining cross-country income differences has been on the rise while the interdependence -as implied in Ventura (1997) for instance- among countries through international linkages has been proved to drive convergence. However, as Slaughter (1997) states, trade between countries is not sufficient proof that trade helps cause per capita income convergence. Taking a highly simplified version of economy, he indicates that trade could possibly cause convergence by changing the relative factor endowments across countries. This argument is somewhat similar to the one Eaton and Kortum (2002) makes for distinction between the small and big countries. Hence, technology and other factors affecting total productivity are shown to play an important role in explaining cross-country income differences in both Slaughter (1997) and Howitt (2000) while diffusion of knowledge and technology through trade is to be two key factors in the endogenous growth model constructed by Feenstra (2004).

Based on Howitt (2000), the convergence is to take place not only through diminishing marginal returns to capital but also with technology transfer. Countries in this model are connected with research and development (R&D) spillovers such that all countries engaging in R&D will grow at the same rate in the long-run. However then, convergence is to be limited with only these countries which Howitt refers as “club convergence” which makes the other countries not to grow at all in the long-run. The Schumpeterian type model also implies that even the countries that converge in the long-run will have different productivity levels, a result neoclassical model would not get. It shows that long-run productivity differences to be endogenous and depend on the incentives to innovate and accumulate capital. Therefore, the model states that differences in per capita income among countries are not only the result of differences in capital stocks but also the differences in relative productivities.

Keller (1998) re-examines the empirical evidence presented by Coe and Helpman (1995) on the relationship between international R&D spillovers and trade. The results suggest that actual international trade patterns would not have the significant positive effect on R&D spillovers as Coe and Helpman (1995) stated. Rather, counterfactual trade patterns or even some other specifications which are not trade

related are to have positive relationship with international spillovers. So, international trade patterns may not play as much important role in R&D spillovers or technology diffusion as it has been implied by previous studies.

The total factor productivity is another variable that is affected by the change in trade openness and/or trade shares. Miller and Upadhyay (2000) for instance find that (trade) openness measures, trade orientation (i.e. terms of trade) and human capital are potential determinants of total factor productivity. Among others however, they indicate that human capital is the foremost contributing one, followed by trade orientation with openness coming the last. Again, a constructed instrumental measure of trade will be useful to analyze the effects, regarding total factor productivity differences.

To be a last note on the effects of intermediate goods trade on productivity; Feenstra (1996) shows that the small country even may face with decreases in the aggregate output level due to efficiency loss and thus increasing fixed costs of innovating new intermediate products. The difference in rate of growth in economies is observed to depend on the relative sizes of the countries under the endogenous growth model discussed above. Therefore, increasing the size of a country then leads to expanding the variety in intermediate goods and results in efficiency gains in production of the final goods. Yet, expanded variety in goods exported is found to have a positive effect on growth rate in several empirical works while significance is subject to differ among the studies. Another implication is the decreasing fixed costs of innovating new intermediate inputs. This is the cause of a permanent increase in the output due to a bigger country size. However, Jones (1995) and several other empirical work [i.e. Young (1998)] state that any change in R&D policies in terms of size or subsidies would not yield a permanent increase in growth rate. So, the size or scale effect and productivity increase would not be related to the cases where policies do not matter.

2.2.3. Empirical Literature

Trefler (1995) called “the case of missing trade” where H-O-V model could not predict the effects of home (country) consumption bias and international technology

differences. He has modified the standard H-O-V model to explain what accounts for cross-country productivity differences. Allowing technology differences in Ricardian sense and using an endogenous growth model tend to explain the differences in per capita income levels and the convergence issue more precisely than the H-O-V model with factor price equalization theorem or the neoclassical exogenous growth model as implied in Mankiw et al. (1992) to explain the relationship between total factor endowments and income levels does. The emergence of endogenous growth theories – which allow for technology differences- by early 1990s led to new studies that are critical to the neoclassical exogenous models such as Mankiw et al. (1992), made use of. There are many empirical studies attempting to reveal the trade effective dynamics on economic growth and development since then. In this section, a vast body of empirical literature on the structure of international trade and its role through various channels is reviewed.

The question of trade and growth is still an ambiguous one although most of the existing literature exerts a positive relation. Like the immiserizing growth arguments however, Rivera-Batiz and Romer (1991) show that without diffusion of knowledge, free trade in differentiated intermediate goods would increase the income level but not the growth rate in each country. They reach even controversial results on the change in growth. Extending the analysis by Rivera-Batiz and Romer (1991), Li (1996) states that even if a country's growth rate is reduced in trade equilibrium, the country may still be better off because of free trade; the smaller of the countries engaged in trade will most likely be better off while the big economy may gain or lose depending on their initial endowments; and the larger a country's trade partner is, the larger is the country's gain from trade. It seems that there is no unambiguous answer to the impact of trade on growth for both the small and big countries. The arguments above will be useful for discussing the estimated effects of population and country size on growth.

As stated above, estimating the effects of trade on economic growth is difficult because the variable chosen to represent trade may be endogenous. For instance, trade policies are usually correlated with other factors related to income (growth) since for instance adopting free market trade policies should bring other policy measures such as

financial liberalization where it is the case in most of the developing countries following the 1980s. Although regressing per capita income variables on the trade shares (the ratio of imports or exports to the GDP) may suggest a positive relationship between the two, the potential endogeneity problem does not allow us to reach an absolute conclusion.

Harrison (1996) argues, despite the already voluminous empirical efforts in this area, it is easy to be skeptical of past results for a number of reasons. First she states, “different studies have used a dizzying array of *openness* measures, methodologies, and sample countries, leading to results which may differ for any number of reasons. Most research has examined the relationship between economic growth and trade volumes, not policies - this is partly because measuring *policy* poses difficult questions.” Hence, it is essential to have an instrument for trade that should not affect growth. Here, a brief review of trade policy and economic growth relations literature based on Rodriguez and Rodrik (1999) will be introduced in order to shed some light on the path towards instrumenting trade and the introduction of gravity equation in the literature.

Dollar (1992) uses two separate indices that relate to outward orientation: “index of real exchange rate distortion” and an “index of real exchange rate variability”. He explains outward orientation in terms of these indices such as having a low distortion and little variability in real exchange rate. However, the indices he uses are problematic in the sense that they are determined mostly not due to trade policies but to monetary and exchange-rate policies. The *distortion* index on the other hand will be influenced by geographic variables. Dollar produces a country ranking based on weighted average of both *distortion* and *variability* measures. Since he does not use any regional dummies or other standard regressors such as initial income, education, the coefficients on *distortion* and *variability* are over-estimated. If any of the omitted variables are added, the coefficients on two indices become smaller and insignificant.

Sachs and Warner (1995) create an index of openness indicator (OPEN) which is a zero-one dummy based on five different characteristics. However, Rodriguez and Rodrik (1999) re-examine the index ‘OPEN’ and find that the most part of the index is determined by two of the characteristics, black market premium and state monopoly of exports. Then they ask to what extent the two variables would be measures for trade

policy and the fact that both of the variables are correlated with some other macroeconomic variables makes the answer close to negative. Multicollinearity among the independent variables -and the dependent variable- along with potential endogeneity problems due to macroeconomic variables other than trade policy both state that the index used for openness is not appropriate once again.

Providing an extensive review of the literature on the relationship between trade orientation and economic performance, Edwards (1993) classifies the discussion into two distinct lines of research: i) detailed multi-country studies of protectionist practices and liberalization episodes; ii) cross-country regression analyzes on the relationship between exports growth and economic performance. What he argues is that the mechanisms through which trade affects economic performance are often regarded as important case studies in terms of policy-making, giving the examples of Korea and Chile. Edwards (1993) show that most of the cross-country regression work carried out until then had empirical and conceptual shortcomings while theoretically simplified models being unable to show the exact mechanism through which exports expansion affects GDP growth.

Edwards (1997a) takes a different approach stating that ‘robustness’ of the (trade) openness indicator is much more important than being satisfactory in explaining the measure. He then runs regressions of total factor productivity growth on nine alternative openness measures. The TFP growth measures are Solow residuals from panel regressions of growth on changes in capital and labor inputs. By weighting the regressions of TFP growth on per capita GDP in 1985, he concludes that “there is a significantly positive relationship between openness and productivity growth.” Rodriguez and Rodrik (1999) show by redoing the regressions of Edwards (1997a) that the weighting is inappropriate. The indexes he uses are suffering from heteroskedasticity and identification problems as well as data inconsistencies so do not provide sound instruments for trade policy.

Ben-David (1993) measures the effect of trade policies on income by asking whether trade liberalization leads to a reduction in the dispersion of income levels among liberalizing countries. He studies the EFTA or EEC countries. This paper is an

example of the literature on the effect of trade on convergence. Trade liberalization is only expected to lead income convergence through the factor price equalization (FPE). However, as Slaughter (1997) argues, the openness in economies is more because of convergence in capital-labor ratios rather than factor prices. Thus, it becomes unclear how trade liberalization causes the income convergence. It is also not valid to exert that there is definitely a relationship between the level of income dispersion and growth rate. Income level convergence does not necessarily imply a positive growth rate. The economic region he examines seems to have convergence as the result of factors mostly not related to trade liberalization.

Geography on the other hand has been one of the most discussed factors in trade literature. The gravity equation has gained much ground in explaining bilateral trade and its cross country effects. Eaton and Kortum (2002) for instance, investigate the magnitude and direction of the impact of geographical barriers and technology levels of trading partners on bilateral trade between 19 OECD countries. Using different measures for estimating bilateral trade, they prove that the important factors impacting are relative wages, technology and human capital stock, population density etc. Distance between countries and price indices are imperfect proxies for estimating the bilateral trade. Therefore, they use geographical measures as instruments for price indices. Sharing borders and languages are factors reducing the effects of geographic barriers or distance. Thus, we expect the standard gravity equation to yield similar results although there might be some counterfactual results. Technology takeovers are somehow related since falling barriers would lead to more technology transfer across countries. The main point in estimating the bilateral trade -using such factors mentioned above- among countries is to get the most plausible instrument for actual trade.

Thus, recent studies on the impact of trade on cross-country income growth rates have been investigating for alternative instruments for trade. Frankel and Romer (1999) provide geographical instruments for countries' overall trade based on the standard gravity equation. The distance between countries that have bilateral trade and then the country size are used as instruments which are seemingly unrelated to any other

factor affecting on the income. While using one of the instruments however, they control for the other since they are negatively correlated.

Constructing an instrumental variable for trade and estimating the effects on income suggest that the trade share may not have a positive significant effect on income growth while in some cases trade variables have insignificant positive or again insignificant negative coefficients. In general, using geographical variables as instruments for both bilateral and international trade could be said to eliminate the endogeneity problem while does not provide satisfactory results in explaining the effects of trade on income. In sum, Frankel and Romer (1999) conclude that the effect of trade on income level (differences) could not be identified through correlations between the two. Therefore, focusing on the geographical component of trade, they show that some countries have higher trade shares due to their proximity to well-populated countries, or others do less trade since they are isolated. Frankel and Romer (1999) assess that using geographical factors as instruments for trade is a viable solution since they are not consequences of income or government policy. In general, they state that trade raises income while -based on the relation between geographic component of trade and income level- the empirical analysis indicates that a one percent rise in the ratio of trade to GDP gives a rise of at least one and a half percent in income per capita. Their results also suggest that within-country trade increases income. Countries those are larger so that they may have more opportunities for domestic trade have higher income levels. Both international and within country trade raises income through capital accumulation and income for given levels of capital, they conclude. Frankel and Romer (1999) last argue that the role of geographical component of trade is quantitatively large enough to provide an understanding of the trade share estimation while remaining cautious about policy-induced growth in trade; though they apparently favor the first one to the latter.

As stated above, the relationship between international trade -instrumented by trade policy measures- and countries' growth rates has been investigated under several different approaches. While it is widely accepted that trade has a positive impact on the growth rates, there have been really controversial results suggested by the empirical

studies in growth theory. It has also been theoretically hard to link trade policy with equilibrium growth and to assess the distributive effects of trade policy. As Edwards (1997b) argues, it has been difficult to obtain satisfactory data on total factor productivity (TFP), trade orientation and social conditions such as inequality and income distribution even if the growth rates are available. While Frankel and Romer (1999) assess the endogeneity issue, the problem to acquire the relevant data in certain satisfaction raises the issue of measurement in empirical studies (Edwards, 1997b). Thus, it is very crucial to construct a model of growth which is able to show the effects of trade in a comprehensive and give sound estimation results in empirics.

Most of the literature use cross-sectional averages or initial values of the variables for the use of time-series data. Applying such an approach to developing countries has two shortcomings. First, the use of cross-section data makes it impossible to control for unobserved country-specific differences, possibly biasing the results. Second, long-run averages or initial values for trade policy variables - particularly in developing countries - ignore the important changes which have occurred over time for the *same* country. Harrison (1996) for instance, demonstrated that the estimated effects of openness are stronger when panel data is used. Accordingly, changes in some openness variables would help explain subsequent changes in growth rates within countries although that was not true for all the openness measures. Rodriguez and Rodrik (1999) cite and briefly review the paper by Harrison (1996) and praise the methodological contribution for it uses a panel setting while they indicate there are two basic problems: the available time series are too short and the variables exhibiting a robust relationship with GDP growth such as black market premium are problematic.

It may be argued to use different instrumental measures for trade other than geography; however it is hard to come up with variables that are only effective on bilateral and international trade and not on income growth rate. This endogeneity problem and the potential correlation between any instrumental variable and the error term in the main equation remain as two important obstacles for the use of alternative instruments. Including income levels and other variables such as education, investment would increase either the probability of endogeneity or identification problems in cases

where trade share or other policy variable is used. Another approach Frankel and Romer (1999) take is to decompose the income affecting factors in a sense that Klenow and Rodriguez-Clare (2004) do. First decomposition estimates the impact of trade on the capital ratio, schooling and productivity while the coefficient of the latest is relatively large. For the second decomposition, they estimate the impact of trade on a given initial income level and subsequent growth rates. Again, the impact is said to be large.

Gallup et al. (1999a; 1999b) investigate the role of climate, existence of malaria (in tropics), population and country sizes, location-specific elements such as being on the coastal line and sea routes, in a temperate-zone; together with other economic and political aspects as they conclude that policy variables and geographical factors including climate are very much effective on countries' trade openness and long-term economic development in the world. The similarities in these aspects in juncture with several channels of inter-links between countries lead the way for fostering economic growth via international trade or reducing it. One note should be added from Acemoglu et al. (2002) which implies that geography matters but in a time varying way. As they call it, a "sophisticated geography hypothesis" is relevant in explaining the Europeans' creation of "latitude specific" technology, such as heavy metal ploughs that only worked in temperate latitudes and not with tropical soils.

Regarding the importance of the gravity equation, Anderson and Wincoop (2003) provide an insightful analysis to the border puzzle while introducing a theoretical basis to the gravity equation. Their benchmark study is the one by McCallum (1995) in which he estimated the gravity equation for trade flows among 30 US states and 10 Canadian provinces. McCallum estimated a simple gravity equation model incorporating the exports between bilaterally trading countries as the dependent variable while having their GDPs, the distance between them and a dummy for being a state or province as independent variables. What he finds is a dramatic border effect which suggests that interprovincial trade is some 22 times larger than cross-border trade, once it is controlled for distance and size. Criticizing most of the empirical studies using gravity type of models as theoretically groundless, Anderson and Wincoop (2003) simplify the earlier theoretical models brought forward (see; Anderson [1979] and

Deardorff [1980; 1998]) while adding up new dimensions to the one used by McCallum (1995) to better estimate the border effects between the US and Canada. Accordingly, the previously used gravity equation set-ups led biased estimations due to omitted variables with a general lack of understanding of what is driving the results. They decompose the trade resistant factors into three categories to include the remoteness of partner countries to each other, and to all other regions, respectively. Such a *relative* distance measure could play a better role in explaining the trade variations in a gravity equation, accordingly. The difference with a more consistent and efficient estimate of the border effect is plausible while substantial, Anderson and Wincoop (2003) assert. The enormously large cross-border effects implied by earlier studies become more plausible though still significant, they indicate. The paper makes use of data on trade, distances, GDP and population for Canadian provinces and the US states as well as 20 other industrialized countries (which is an extension to the data analysis of McCallum [1995]). Their main finding is that the national borders across the industrialized states reduce trade by moderate amounts of 20-50 percent, compared to the intra-national trade.

Picking up from three different explanations of increasing world trade, Baier and Bergstrand (2001) discuss the most relevant factor to reveal the factors determining the increase in bilateral trade for 16 OECD countries between late 1950s and late 1980s. With a comparative analysis using the gravity equation, Baier and Bergstrand (2001) find that income growth explains about 67 percent, tariff-rate reductions about 25 percent, transport-cost declines about 8 percent, and income convergence virtually none of the average world trade growth in their sample. Their analysis also explains around 40 percent of the variation in cross-country trade growth throughout the sample period.

Redding and Venables (2004) estimate a structural model of economic geography using cross-country data on per capita income, bilateral trade, and the relative price of manufacturing goods as they conclude that the geography of market access and supply sources are significantly important in explaining cross-country per capita income variation (Redding and Venables, 2004). Controlling for other

geographical, social and institutional characteristics, their main result still remains robust.

Haveman and Hummels (2004) show that gravity equation as a statistical relationship and not a specific prediction on bilateral trade could be generated from a model of incomplete specialization. Furthermore, they demonstrate that the predominance of zero values in bilateral trade matrix as “puzzles” are broadly inconsistent with complete specialization models but are consistent with the alternative hypothesis of incomplete specialization. Last, they prove that the explanation for why the gravity equation works fine has considerable relevance for how the gravity equation is interpreted and used (Haveman and Hummels, 2004).

In an empirical work, Baier et al. (2006) show that the estimated values of labor and capital productivities which rationalize trade flows across countries are related to total factor productivities which rationalize output differences among countries. These productivities stemming from trade flows are related to institutions and geography across the countries. Accordingly, protection of property rights is the most dominant factor on both labor and capital productivity, with geography being less important and democracy even less important. Baier et al. (2006) also assert that protection of property rights has similar effects on workers with primary education only and those with more education. They separate the potential influence of geography on productivity into “productive geography” which affects productivity through geographic characteristics, and “market geography”, which affects productivity through access to large markets and the ability to specialize and exploit economies of scale (Baier et al., 2006). Then they introduce property rights and democracy as other estimators of productivity as they find that government’s protection of property rights explains around 69 percent of the cross-country variation in labor productivity and 22 percent of the cross-country variation in capital productivity. The effect of democracy on productivity however is not obvious in Baier et al. (2006).

In a more recent empirical work by Anderson and Yotov (2009) on the other hand, the incidence of bilateral trade is calculated by using the neglected properties of the structural gravity model. These components are disaggregated by commodity and

region, and then re-aggregated into useful forms for economic geography. The model uses industry level bilateral trade flows, output, and expenditures for each trading partner to estimate the gravity equation and calculate multilateral resistance (to trade). Anderson and Yotov (2009) additionally use data on bilateral distances, population, contiguous borders, presence or absence of provincial or international borders, and elasticities of substitution at the commodity level. Last, a dummy variable to reveal the effects of the Agreement on Internal Trade (AIT) on trade flows and costs within Canada is generated. They reach the conclusion that sellers' (exporter, for our purpose) incidence is on average some five times higher than buyers' (importers, for our purpose) incidence for Canada's provinces –where the dataset contains all provinces of Canada; fifty US states and District of Columbia; and the rest of the world-, between 1992 and 2003 (Anderson and Yotov, 2009). Accordingly, sellers' incidence falls over time due to specialization, despite the constant gravity coefficients. Their final result indicates that this globalizing force derives big reductions in “constructed home bias”, the disproportionate predicted share of local trade; and large but varying gains in real GDP (Anderson and Yotov, 2009).

The next chapter (3) will take from where Baier et al. (2006) and Anderson and Yotov (2009) leaves off; in order to understand the institutional dimension of trade dynamics. Institutions and geography are explicitly shown to be of importance both in international trade and growth literatures. Economic development of the 20th century continues to lead more debate around the most relevant factor behind the dramatic increase in world trade and income. Regional income disparities and cross-country or within country inequalities are also subject to deeper analyzes with the rise of new trade literature (see Alesina and Rodrik [1994] for instance for an appropriate model); while regional trade dynamics are subject to specific studies as in Dikkaya and Orhan (2004) who assess the Economies of the Black Sea Economic Cooperation (BSEC) countries' bilateral trade through an extended gravity equation. Therefore country-specific and across regional estimates of trade with more and more disaggregated commodity classifications reveal much better information compared to generalized analyzes.

2.3. On Governance and Trade

This section focuses on the cross-lines and intersections between the governance and international trade literatures where it begins with theoretical background information on the underlying factors. Trade, institutions and growth literatures have parallel lines and important intersection points. Therefore a brief introduction to the role of institutions with special reference to the governance indicators will proceed to the relations among institutions-trade and growth dynamics.

The World Trade Organization's (WTO) World Trade Report 2004, in that sense, provides an insightful and analytical framework for better understanding the governance-related dynamics behind international trade. The section on governance and institutions emphasizes that governing the trade flows and contractual relationships among the tradesmen has been very crucial throughout the history for several reasons. Referring to Greif (1993), the report concludes that corruption, democratic accountability and the rule of law are the foremost conditions that ensure contract enforceability which in turn yields a suitable environment for sustainable trade. The report also underlines that the compatibility among countries' trade codes, logic of law and other institutional aspects are significant in bilateral trade performances.

2.3.1. Theoretical Literature

The literature on governance will be analyzed in three distinct lines of research in this section: i) institutions in a historical perspective; ii) the role of governance in explaining investment and growth dynamics; and iii) the role of governance in determining trade and their interplay. Engerman and Sokoloff (1997), Greif (1992; 1993), North and Thomas (1970; 1973) and to some extent North (1990) and Acemoglu et al. (2001) provide some historical perspectives on the role of institutions, reflected primarily by the governance indicators as we know them today.

Greif (1993) for instance search for institutional roots in understanding the 11th-century Maghribi traders' coalitions. Accordingly, the *geniza* (term referring to the

free, private and competitive Mediterranean trade) documents by Maghribi traders reveal that they had operated through overseas agents, who are the service suppliers relevant for a commercial venture while the capital, profit or both are shared with a merchant located in a different trade center (Greif, 1993). They overcome the commitment and thus the agency problem via reputation-based community enforcement mechanism as the overseas agent was operating with a capital that he did not own in order to achieve efficiency. The potential opportunistic behavior is however eliminated through collective action on punishment and its persistency (Greif, 1993). A wage and employment pay-off setting is used to determine the optimal level of earning when cheating or being honest. The optimal wage that a trader should pay its agent is therefore determined by the potential cheating incentives and the motions of punishment in a collective action setting.

Anderson (2008) on the other hand provides a theoretical model that takes contract enforcement endogenously determined. Despite being a probabilistic, he states, the probability of contract enforcement depends on certain rules and processes. Accordingly, any stimulus or incentive to trade might in turn induce the trading parties to change rules or processes to improve enforcement. Anderson (2008) demonstrates that his model predicts such a positive “knock-on” effect occurring when the elasticity of traders’ supply is sufficiently high and vice versa. By endogenizing the institutional foundation of trade, Anderson (2008) analyzes the comparative statics of a model of the demand for contract enforcement by traders. He asserts that the model put forward could operate as a platform capable of supporting extensions, and while the basic model is complex, it is still regarded as having the minimal structure needed to address the subject (Anderson, 2008). His model makes no distinction between formal and informal enforcement; therefore having the two in the same setup to see whether they are complements or substitutes. The supply side of enforcement from the government is not modeled while he argues that such a setup including the government might be useful for it would describe its objectives and the constraints it faces in setting up contract enforcement and collecting the taxes to pay for it (Anderson, 2008).

Anderson (2008) last discusses the historical and policy wise implications of the model as he answers to the question of the rise of the Western Europe after 1500s compared to the decline in China, for instance. He develops an argument that puts forward the reasoning of elastic supply of traders in Europe –with so many disaggregated governments- that are open to competition from outsiders while the latter having a sustainable single government for years. Therefore the European tradesmen have acquired the capability of pursuing a more competitive environment operative under the rule of law, he explains. Another striking result accordingly is that the third world and transition economies have not done better than the developed ones throughout the history, mostly due to the steady-state position in securing and improving the contract enforcement although the first type of countries face with rapid declines in effective trade costs.

Below table (2.1) provides a summary of systematically put review of the selected theoretical literature on the governance-trade relationship which widely relies upon a game-theoretic setting in many cases, as opposed to the above mentioned series of theoretical papers since they mostly adapt a historical or gravity-type setting.

Table 2.1. Sample Theoretical Literature on Governance

Paper	Discussion	Theoretical Model	Final Remarks
Grossman, G. M. and E. Helpman. (1994). Protection for Sale. <i>American Economic Review</i> . 84.4, 833-850.	Question: How the interest groups compete to receive favorable treatment from the government?	Type: Menu auction Set-up: N individuals with different factor endowments;; government sets tariffs for products; factor-owners form lobbies to influence policy (protection from world prices) in exchange for payments; offers a menu of payments for each policy; government maximizes the total payments and the social welfare Corruption: Government receives payments to change its trade policies	(1) Each lobby sets its contribution schedule so that the <i>marginal</i> change in policy matches the change in lobby's gross welfare; (2) If there is a single lobby, it captures the whole rent; (3) When lobbies compete, their payment reflects the strength of their opponents: the one with less political strength makes the larger contribution. (4) If everybody is represented by a lobby, they balance each other, the free trade prevails, and all surplus goes to the government; (5) The interest groups will be unwilling

			to use efficient transfer mechanisms, because the government can shift from one group to the other without any cost and use this as a threat to capture the whole surplus
Hochman, G. and C. Tabakis. (2007). Trade, Institutions and Economies in Transition.	Question: How does openness to trade affect the rule of law (RoL)?	Set-up: Two-stage game where elite offer political contribution effective on government's choice on the RoL, and next country opens up to trade characterized by perfect RoL with the partner country relations. Second-stage is based on the monopolistic competition models	Equilibrium RoL is higher than the autarky regime where trade is present. As long as the majority of firms benefit from the rule of law, openness to trade in goods strengthens legal institutions; and vice versa. Trade is contributive to government's reform desire on legal institutions. Two motivations for government: I) aggregate welfare effect, ii) firms that benefit from the RoL; while iii) where firms worsen by the RoL improvement might play a counter role
Krueger, A. (1974). The Political Economy of Rent-Seeking	Question: Scarcity (cause by quantitative restrictions)	Set-up: Quantity restriction on imports creates persistent excess profits; resources shifts to the import-distribution (or substitution) sector and	The welfare loss associated with quantitative restrictions is greater than the loss from the tariff equivalent of those restrictions because

Society. <i>American Economic Review</i> . 64.3, 291-303	induces rent seeking	to rent-seeking activities, tariffs do not create rents – only causes shift in resources.	shortage economy leads to rent-seeking
Laffont, J. and J. Tirole. (1991). The Politics of Government Decision-Making: A Theory of Regulatory Capture. <i>Quarterly Journal of Economics</i> . 106.4, 1089-1127	Question: (1) What are the determinants of interest groups' power? (2) What is the effect of regulatory politics on the public agency? (3) Do interest groups' pressures offset each other?	Set-up: Principal-agent relationship (hidden action and adverse selection) government procurement, production cost of the firm is private information, but observed by agent, the firm's output has negative externality on another interest group Corruption: Bribe paid by the firm to magnify price of the good sold to the state; bribe paid by the special interest to reduce the price offered to the firm	1) The organizational response to the possibility of regulatory agency politics is to reduce the stakes interest groups have in regulation; (2) The regulatory inefficiencies associated with the pressures of several interest groups may compound rather than cancel; (3) An interest group has more power when it its interest lies with inefficient rather than efficient regulation

Shleifer, A.; R. Vishny. (1993). Corruption. <i>Quarterly Journal of Economics</i>. 108.3, 599–617.	Question: 1) How does the competition among agents affect corruption? 2) Why does bribery more costly than taxation?	Set-up: Public service provided by the agent at a certain price, the agent decides who gets the good at what price, he also determines whether to turn over the price to the government or not, in case of multiple agents they provide complementary goods and may coordinate their corrupt activities Corruption: Bribe is paid to obtain the good at official price or to obtain it below its official price	(1) Bribery with theft is “worse” than bribery without theft, because it aligns the interest of buyers and sellers (2) “Centralized” corruption is better than “decentralized” corruption, because the former internalizes the externalities (3) Bribery is more distortionary than taxation, because it has more transaction cost due to illegality
Tirole, J. (1996). A Theory of Collective Reputations (with applications to the Persistence of Corruption and to Firm Quality. <i>Review of Economic Studies</i>. 63, 1-22.	Question: Is it possible to explain “high-corruption steady-state” by history-dependence, rather than multiple equilibria?	Type: Principal-agent (hidden action and adverse selection) Set-up: Principal cannot observe the type of the agents (honest, corrupt, opportunistic), but makes inference from the agency’s reputation (which is aggregate of individual reputations); principal needs the agent to carry out an investment;	When individual reputations are not observable, the past behavior of the member’s group can be used to predict the member’s individual behavior. This makes the behavior of new members dependent on the past behavior of their elders and makes them suffer from an original sin of their elders after the latter are gone

		if the group reputation is bad, he reduces the level of investment; if the investment level is low all opportunist agents engage in corruption. Corruption: Corrupt agent reduces the value of investment	
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2.3.2. Empirical Literature

The literature on trade and institutions are closely related, as shown by Rigobon and Rodrik (2004), although they imply contrary signs of influence on growth. Using identification through heteroskedasticity (IH) technique along with several IV regressions and robustness checks on the inter-relations between trade (openness), economic institutions (rule of law), political institutions (democracy) and income levels, Rigobon and Rodrik (2004) find a strong casual impact from economic institutions to income levels while one of their most intriguing results, as they state, is the strong negative effect of trade on democracy. They divide the cross-country dataset into two sub-sample groups as the first one includes colonies versus non-colonies while the second focusing on continents aligned on an East-West versus those aligned on a North-South axis. Rigobon and Rodrik (2004) find evidence for positive effects of democracy and the rule of law on income levels, expectedly, with latter having a much greater effect. Accordingly, higher income produces further openness and better institutions, although their effects are not very strong. A prevailing controversy in their results however emerges as the negative or insignificant effects of openness on incomes. Overall, their research reveals controversial results to the general body of growth literature, at least partly. Rodrik, Subramanian and Trebbi (2004) on the other hand discuss the relative contributions of institutions, geography and trade in determining income levels with instrumental variables for trade and institutions. Geography has only strong indirect effects through institutions to determine income levels while they have at best weak direct effects on income once they control for institutions. Trade is again almost insignificant –often with a negative sign in the income equation- when institutions are controlled for, according to Rodrik, Subramanian and Trebbi (2004).

Dollar and Kraay (2003) on the other hand state that the stylized facts of the current growth literature put forward the argument that countries with better institutions and advanced trade tend to grow more while countries with better institutions tend to trade more. A mutual –positive- relationship between economic institutions, trade and incomes becomes crystal clear in their analysis. Instead of a cross-country setting of the log-level of per capita GDP on instrumented measures of trade and institutions, they run

regressions of changes in growth rates (in each decade) on the instrumented changes in trade and institutional quality and find evidence for strong effect of trade while a much smaller effect of institutions on growth rates becomes evident. For the long-run however, they find that both explanatory variables are important factors of changes in the income levels. A striking result of their analysis, relevant for the purpose of this research however is that they find using direct measures of trade policy rather than trade volumes (a fraction of GDP over time) almost impossible due to the extensive difficulties in constructing a convincing measure of overall trade policy. Therefore, it might be worthy of thinking some sort of indices or measures for the trade policy effect, other than tariffs or non-tariff barriers, while persuading the inter-relations between trade (policies) and economic institutions.

What is contrary to Dollar and Kraay's (2003) result that indicates relatively smaller role of institutions compared to that of trade in the short-run could be found in Rodrik (2002) where he states that *"trade- or, more specifically, government policy toward trade- does not play nearly as important role as the institutional setting."* Counting there major (or deeper, as he states) determinants of growth, Rodrik (2002) cites geography; integration (trade); and institutions. After accounting for arguments of three major causes of growth, Rodrik (2002) concludes that institutional quality is of much more importance than others.

Controversial results around the effects of governance and geography on economic growth or income levels are also evident in the governance-trade literature. The aim of this empirical analysis is therefore providing some sort of intuition to the issue as the governance indicators and geographical elements could behave in common or on the contrary. Manifesting their roles in bilateral trade flows becomes crucial so that one could understand if these two broad categories are working together and complementarily or the other way. As it is stated very intelligently, even governance indicators or geographical elements are subject to a variety of understandings or readings. In a highly capable work, corruption for instance, is categorized into two dimensions: i) de-centralized and ii) centralized where it is concluded that the more is the corruption organized and centralized the less is the cost to the investors and other

agents (Easterly 2002, 247). Such arguments especially become even more appealing when the less developed or developing countries are subject to analysis.

In an IMF working paper, Levchenko (2004), later published in 2007, analyzes the relationship between institutional quality and international trade in both directions, based on two different approaches. Referring to the potential differences among trading countries which create income level gaps, Levchenko (2004) argues that the institutional base is the key that is effective on trade. The first approach takes a Ricardian-type model to capture the productivity differences of institution-dependent sectors which in turn creates trade gains in the North (i.e. developed world)-South (i.e. developing countries) trade. The second approach based on Grossman-Hart-Moore model of incomplete contracts to make the role of institutions more explicit in determining trade performance. The weaker the institutions are, the more the number of incomplete contracts is observed, according to this framework. The basic Heckscher-Ohlin trade model on the other hand extends the Ricardian-type model of institutions to understand the changes in relative factor prices and gains or losses stemming from bilateral trade (i.e. North and South). Institutions like contract enforcement, property rights and investor protection in such a modeling scheme are determinants of the relationship between production factors -which manifests it in terms of incomplete contracts. The empirical work he carries out is making use of industry level trade shares rather than volumes in order to highlight the implications of institutional quality on bilateral trade.

After providing several robustness checks in his empirical analysis that includes 389 industries from 177 countries, Levchenko (2004) concludes that the South is expected to gain more from trade since it would abandon producing institution-dependent sectors in order to avoid costs arising due to the weaker institutions under the classical Ricardian view. The Heckscher-Ohlin model of trade under Grossman-Hart-Moore framework however implies that the North gains more than the South and the latter might even incur losses due to bilateral trade as the labor intensive sectors –which are potentially the most institution-dependent ones- would lose while capital intensive sectors would earn more. Given the Grossman-Hart-Moore type framework with the

number of incomplete contracts as indicator, the more efficient institutions in the North are therefore expected to lead specialization in more attractive industries (Levchenko, 2004). Last, not the least, international trade is expected to provide an incentive to climb the quality ladder in terms of institutions while it is possible to have bad institutions indefinitely under the autarky regime according to Levchenko (2004).

Last to mention here is Acemoglu et al. (2005c) on the rise of Western Europe through Atlantic trade. What they argue is that the rapid growth witnessed in Europe after 1500 is due to the growth in countries with access to the Atlantic Ocean which enabled significant amounts of trade with the Americas, Africa and Asia through Atlantic. The main reasoning behind this argument however relies on the direct effects of such a trade mechanism as well as the changing institutional structure which developed a friendlier environment for the merchants' securing their property rights against the European monarchs. As they became richer and stronger through growing Atlantic trade, Acemoglu et al. (2005c) assert that they began constraining the power of the monarchy and obtained changes in institutions to have protection over their property rights. They assess these institutional changes essential and in fact central in explaining the subsequent economic growth.

Following the above review of empirical literature that captures both the effects of international trade and governance (as proxies for institutional basis) in explaining income level or growth differentials, below is the continuation of the trade-governance literature with special reference to selected empirical studies searching for the inter-relationship between international trade and governance indicators.

Table 2.2. Sample Empirical Literature on Governance

Paper	Discussion	Theoretical Model	Empirics	Final Remarks
Aysan, A. F.; O. F. Baykal and M. A. Véganzonés-Varoudakis. (2011). The Effects of Convergence in Governance on Capital Accumulation in the Black Sea Economic Cooperation Countries. <i>CERDI Etudes et Documents</i>. E 2011.03, 1-36	Question: What is the effect of governance convergence on capital accumulation in developing and particularly in the BSEC countries?	Model: (N/A)	Data: Panel of 43 developing countries; for the period of 1985-2005 Dependent Variable: Capital accumulation (share of investment in GDP) Central Independent Variables: QA, PA, PS, GOV1 and GOV2, Realr, GDP growth Control Independent Variables: Lag of dependent variable Methodology: Dynamic GMM, Arellano-Bover/Blundell-Bond, OLS and Panel	Significant/positive effect of governance on capital accumulation, with the QA being the most effective one
Aysan, A. F.; M. K. Nabli and M.	Question: How does and what type of	Model: (N/A)	Data: Unbalanced panel of 32	(1) Governance in terms of QA and PS is effective on

A. Véganzonés-Varoudakis. (2007b). Governance Institutions and Private Investment: An Application to the Middle East and North Africa. <i>The Developing Economies</i>. 45.3, 339-377	governance affect private investment in the MENA region?		countries; time period: 1980-2002 Dependent Variable: Private Investment Central Independent Variables: QA, PS, PA, GOV Control Independent Variables: Structural reforms, Human capital, Oil exports, Realr, Growth Instrument: TenSyst Methodology: 3SLS	private investment decisions in the MENA countries (2) Structural reforms (i.e. financial development, trade openness and human development) have direct or indirect (through positive effect on governance) effect on private investment decisions
Azarbayjani, K.; H. Shirazi and N. Samiei. (2010). The Effect of Corruption on Bilateral Trade of Selected Countries in	How does corruption affect bilateral trade in select MENA countries under a gravity equation?	Model: (N/A)	Data: Unbalanced panel of 9-countries; time period: 2002-2008 Dependent Variable: Log of exports as bilateral trade volume Central Independent Variables: Log	Both models with the CPI and CCI Show significant effect of corruption on bilateral trade; with the latter having more moderate coefficient

the Middle East.			GDP, Log Population, Log Distance, Language dummy, Border dummy, Log Corruption Perceptions index (CPI), and Control of Corruption index (CCI) Methodology: FE, RE	
Bandyopadhyay, S. and S. Roy. (2006). Corruption and Trade Protection: Evidence from Panel Data.	Question: What are the effects of corruption and poor institutions on trade protection?	Model: (N/A)	Data: Unbalanced panel of 88 countries; time period: 1982-1997 Dependent Variable: Level of trade protection Central Independent Variables: Corruption (ICRG), Repudiation of contracts (Risk of Contract Enforcement) Control Independent Variables: RGDP per capita, government expenditure/GDP ratio, CA balance/GDP ratio, Population size Methodology: OLS, 2SLS	Corruption significantly increases trade protection or reduces openness. Significant/negative effect of corruption and risk of contract enforcement on openness, RGDP, government expenditure and CA deficit.

			Instruments: British colony	
Ehrlich, I. and F. T. Lui. (1999). Bureaucratic Corruption and Endogenous Economic Growth. <i>Journal of Political Economy</i>. 107, 270-293	Question: How does corruption affect growth rate?	Set-up: (Homogenous or heterogeneous) agents invest in human capital (socially productive) and political capital (socially unproductive), human capital increases individual income through production, political capital through bribe and extortion	Data: Panel data (1960-1992 with 151 countries) Dependent Variable: Log of GDP Central Independent Variable: Government share in GDP, Red tape (BI), Corruption (BI) Control Independent Variable: Time Methodology: Fixed effect	The relationship between government, corruption, and growth is nonlinear: corruption is more damaging in poor countries, less damaging for advanced democratic countries and efficient autocratic countries.
Evans, J.; P. Rauch. (2000). Bureaucratic Structure and Economic Performance in Less Developed Countries.	Question: How does the bureaucratic structure (meritocracy, tenureship, and wage) affect performance?	Model: (N/A)	Data: 35 Less developed countries Dependent Variable: Corruption index (BERI, ICRG, BI) Central Independent Variable: Institutions (financial, judicial, regulatory) Control Independent Variables:	(1) Meritocracy promotes bureaucratic performance. (2) The effect of competitive salaries and internal promotion and career stability is ambiguous.

<i>Journal of Public Economics</i> . 75, 49-71			Development level, Ethnic differences Methodology: OLS	
Francois, J. and M. Manchin (2007). Institutions, Infrastructure, and Trade. <i>World Bank Policy Research Working Paper No.</i> 4152.	Question: The influence of infrastructure, institutional quality, colonial and geographical elements and trade preferences on bilateral trade	Model: (N/A)	Data: Panel; time period: 1988-2002 Dependent Variable: bilateral trade flows Central Independent Variables: Infrastructure and institutions (FI, TI, EFW) Control Independent Variables: Population, GDP per capita, Tariffs, Distance, Landlocked, Colony Methodology: ML-based Heckman selection; OLS and Tobit	The combination of institutional and infrastructure variation are much more important to the patterns of bilateral trade volumes rather than trade protection. Sample variation in basic infrastructure explains substantial amounts of variation in trade while the results for institutions are mixed
Gatti, R. (1999).	Question: If tariff rates are not uniform	Model: (N/A)	Data: Cross-section with 24-36 countries	Diversification of tariff menus is associated with corruption. Setting trade

Corruption and Trade Tariffs, or a Case for Uniform Tariffs. <i>World Bank Working Paper No. 2216</i>	and their application open to administrative discretion, they create opportunity for extracting bribe		Dependent Variable: Corruption index (GCS) Central Independent Variable: Standard deviation of tariffs Control Independent Variables: Development level, Legal origin Methodology: OLS, IV Instruments: Gini coefficient, Terms of trade shocks	tariff rates at a uniform level limits the possibility of corruption.
Fisman R. And R. Gatti. (2000). Decentralization and Corruption: Evidence Across Countries. <i>World Bank Policy Research Working Paper No. 2290</i>	Question: Does fiscal decentralization reduce corruption?	Model: (N/A)	Data: Cross-section with 51-57 countries; time period: 1980-1995 Dependent Variable: Corruption indices (ICRG, WCR) Central Independent Variable: Decentralization Control Independent Variables: Development level, Ethnic differences, Regional	Decentralization reduces corruption

			dummies, Colonial dummies Methodology: OLS, IV Instrument: Legal origin	
Glaeser, E. L., R. La Porta, F. Lopez-de-Silanes, and A. Shleifer. (2004). Do Institutions Cause Growth? <i>NBER Working Paper No.</i> 10568.	Question: whether political institutions cause economic growth or, alternatively, growth and human capital accumulation lead to institutional improvement.	Model: (N/A)	Data: Cross-section of 89 countries; time period: 1960-2000 Dependent Variable: GDP per capita growth Central Independent Variables: Log GDP per capita (1960), Log years of schooling (1960), Executive constraints (1960-2000), and Expropriation risk (1982-1997) Control Independent Variables: Institutions (Polity IV), Share of population in temperate zones (1995), Plurality (1975-2000), Proportional representation (1975-2000), Constitutional review (1995), Judicial independence (1995) Methodology: OLS	Institutions do not cause growth. Human capital is a more basic source of growth compared to institutions; poor countries get out of poverty through good policies; and subsequently improve their institutions

Gupta, S.; H. Davoodi and T. Alonso. (1998). Does Corruption Affect Income inequality and Poverty? <i>IMF Working Paper no. WP/98/76</i>	Question: How does corruption affect health and education outcomes?	Model: (N/A)	Data: Cross-section with 128 countries Dependent Variable: Health, Education Central Independent Variable: Corruption index (ICRG, KKZ, BI) Control Independent Variables: Development level, Education and Health spending Method: OLS, IV Instruments: Share of imports, Protestant population, Democracy, and Federalism	Reducing corruption can result in significant social gains such as decreases in child and infant mortality rates, percent of low-birth weight babies, and primary school drop-outs
Islam, R. and C.E. Montenegro. (2002). What Determines the Quality of Institutions? <i>Background Paper for the World Development</i>	Question: What are the determinants of quality of institutions?	Model: (N/A)	Data: Cross-section with 82 countries Dependent Variable: Average of governance variables (ICRG and KKZ) Central Independent Variable: Ethnic differences, Income inequality, Legal origin, Initial GDP per capita, Openness, Free media, Index of	Insignificant: Ethnic differences Significant/ Positive: Income inequality, French legal origin, Primary commodity exports Significant/ Negative: Initial GDP per capita, Openness (interpreted as

Report 2002: Building Institutions for Markets, World Bank, Washington D.C.			checks and balances, Primary commodity exports Method: OLS, 2SLS Instruments: For openness – Size and Geography	rent-seeking activity), Free media, Index of checks and balances
Kaufmann, D.; A. Kraay; and P. Zoido-Lobaton. (1999). Governance Matters. World Bank Policy Research Working Paper 2195	Question: Does good governance matter for economic development?	Model: (N/A)	Data: Cross-country Dependent Variable: GDP per capita, Infant mortality, Literacy rate Central Independent Variables: Voice and accountability, Political instability and Violence, Government effectiveness, Regulatory burden, Rule of law, and Graft Method: 2SLS Instrument: Fraction of population speaking a major European language	Good governance is associated with higher income, lower infant mortality, and lower illiteracy
Kaufmann,	Question: What	Model: (N/A)	Data: Cross-section with 175 countries	(1) All variables are significant

D. and A. Kraay. (2001). Growth without Governance. <i>World Bank Policy Research Paper, Washington D.C.</i>	is the direction of correlation between growth and governance?		Dependent Variable: Income per capita Central Independent Variable: Firms size, Ownership (private/state) Control Independent Variables: Rule of law, Voice and accountability, Political stability, Government effectiveness, Regulatory quality, Corruption Method: OLS, 2SLS Instrument: Distance and fraction of population speaking a major European language	in OLS, 2SLS and IV. (2) Measurement error in governance needs to be very large for positive feedback from per capita income to governance. (3) Negative feedback implies that improvements in governance are unlikely to occur merely as a consequence of economic development.
Knack, S. and P. Keefer. (1995). Institutions and Economic Performance: Cross Country Tests Using Alternative Institutional Measures. <i>Economics and Politics.</i>	Question: The impact of property rights on economic growth with proxies such as contract enforcement and risk of expropriation is greater than	Model: (N/A)	Data: time period: 1974-1989 Dependent Variable: Average Annual Per Capita GDP Growth; and Average private investment/GDP Central Independent Variables: Expropriation risk (ICRG), Risk of Repudiation	ICRG/BERI variables are statistically significant in estimating annual per capita GDP growth while they are much weaker at predicting total investment

7.3, 207–227.	that of using proxies such as Gastil indices of liberties		(ICRG), Corruption in Government (ICRG) and Quality of Bureaucracy (ICRG), Contract Enforceability (BERI), Infrastructure Quality (BERI), Nationalization Potential (BERI) and Bureaucratic Delays (BERI) Control Independent Variables: Methodology:	
Knack, S. and O. Azfar. (2003). Trade Intensity, Country Size and Corruption. <i>Economics of Governance</i> . 4, 1-18.	Question: How does corruption is affected by trade density with a selection-bias problem?	Model: (N/A)	Data: Cross-section of 124-165 countries Dependent Variable: Dummy for corruption (TI, Graft index, CPIA, BI and WCR) Central Independent Variables: Log population, Log per capita income; Natural openness, Residual openness Control Variables: Ex-British colony, Stable democracy, Political freedoms	Relationship between corruption and trade intensity disappears with newer corruption indicators and substantially increased number of countries. With the use of samples less subject to selection bias, relationship between corruption and country size also weakens or disappears

			Methodology: Logit	
Laffont, J. and N. Tchetche. (1999). Competition and Corruption in Agency Relationship. <i>Journal of Development Economics</i>. 60, 271-295	Question: How market competition helps principal to solve his information problem with the agent?	In a principal-agent setup (hidden action and adverse selection) government procurement, production cost of the firm is private information, but observed by supervisor, government can pay high wage to reduce the waste or save from wage and accede to pay more to the firms, market competition reduces waste and need for high pay Corruption: Bribe paid to balloon price of the good sold to the state	Data: 30 African Countries Dependent Variable: Corruption index (BI) Central Independent Variable: Import share in GDP Control Independent Variables: Growth, Foreign aid, Education Methodology: OLS, IV Instruments: Growth, Foreign aid, Education	Market competition (proxied by openness) reduce corruption
Larrain, F.	Question: Can	Model: (N/A)	Data: Cross-section and panel data with	Openness reduce corruption

and J. Tevares. (2001). Can Openness Deter Corruption? <i>Center for International Development, Harvard University</i> , Mimeo.	openness deter Corruption?		70 countries, between 1970-1994 Dependent Variable: Corruption index (ICRG, BI) Central Independent Variable: Import, FDI, Average tariff rate and its variability Control Independent Variables: Ethnic differences, Development level, Natural resources, Public expenditures, Religion, Geography Methodology: OLS, IV Instruments: The summation of the product of large country exports by the distance to large countries	
La Porta, R.; F. L. Silanes; A. Shleifer and R. Vishny. (1999). The Quality of	Question: What are the determinants of the quality of governments?	Model: (N/A)	Data: Cross-section with 79-154 countries Dependent Variable: Property rights, Business regulation, Marginal tax rate, Corruption,	Rich, ethnolinguistically homogeneous, predominantly Protestant countries with common law system have better governments

Government. <i>Journal of Law, Economics and Organization</i> . 15, 222-279			Bureaucratic delays, Tax compliance, Infant mortality, School attainment, Illiteracy, Infrastructure quality, Democracy, Political rights Central Independent Variable: Legal origin Control Independent Variables: Ethnic, Religion differences, Latitude, GDP per capita Methodology: OLS	
Lavallee, E. (2004). Governance, Corruption and Trade: A North-South Approach. EURISCO, Université Paris-Dauphine, <i>Mimeo</i>	Question: How does the quality of governance (i.e. corruption) affect North-South trade under a gravity setting?	Model: (N/A)	Data: Panel for 21 OECD and 95 developing countries; time period: 1984-1997 Dependent Variable: Log of exports as bilateral trade Central Independent Variables: Log GDP, Log Population, Log Distance, Colony dummy, Difference in real income per capita and its square, Border-Language and FTA dummies,	(1) Significant/Positive effect of good governance in South on imports from North (2) The square of economic distance is significant in affecting the South's imports

			set of fixed effects Methodology: FE, RE	(3) Corruption is not significant, contrary to the first result
Leite, C.; J. Weidmann. (1999). Does Mother Nature Corrupt? Natural Resources, Corruption, and Economic Growth. <i>IMF Working Paper no. WP/99/85</i>	Question: Does abundance of natural resources cause more corruption?	Model: General equilibrium growth model	Data: Cross-section with 57 countries Dependent Variable: Corruption index (ICRG, WCR) Central Independent Variable: Natural resource export Control Independent Variables: Trade openness, GDP growth between 1970-1990, GDP per capita at 1970, Rule of law, Political stability, Ethnic differences, Regional dummies, Bureaucratic quality, Arms imports, Civil conflicts, and Government expenditures Methodology: OLS, Tobit	Unlike labor intensive natural resources (agricultural and food), abundance capital intensive natural resources (fuels and ores) causes more rent seeking activities (corruption, in particular).

Mauro, P. (1995). Corruption and Growth. <i>Quarterly Journal of Economics</i>. 110.3, 681-712.	Question: How corruption affects growth and investment?	Model: (N/A)	Data: Cross-country Dependent Variable: Growth, Private investment Central Independent Variable: Corruption Index, Bureaucracy efficiency index Control Independent Variables: Political stability, Public expenditures, Religion, Geography, Initial conditions in 1960, Population growth, Methodology: OLS, IV Instruments: Ethnic differences	Corruption reduces growth rate and level of private investment
Mehanna, R. A. (2003). Do Politics and Culture Affect Middle East Trade? Evidence from the Gravity Model. <i>Review of Middle East</i>	Question: The effects of politics and culture on Middle Eastern (ME) trade, under an	Model: (N/A)	Data: 13 ME and 20 partner countries; time period: 1996-1999 Dependent Variables: Log Exports, Log Imports, and Log Total volume of trade	Islamic countries significantly do less trade; British colonies do trade more; corrupt countries have significantly less trade; political freedom not significant

<i>Economics and Finance.</i> 1.2, 155-170.	augmented gravity setting		Central Independent Variables: Log GDP, Log per capita income, Log Distance, Border dummy, Language (English) dummy, Political Freedom index, Corruption Perceptions index, Religion dummy (majority Islam), Colonial dummy Control Independent Variables: ME dummy, Oil-export dummy, RTA block dummy Methodology: OLS	
Méon, P-G. and K. Sekkat. (2006). Institutional Quality and Trade: Which Institutions? Which Trade?	Question: To what extent do different dimensions of the institutional framework affect exports of manufactured and non-manufactured goods along	Model: (N/A)	Data: Panel of 50 countries; time period: 1920-2000 Dependent Variable: Ratio of exports of manufactured; non-manufactured and total goods to GDP Central Independent Variable: Real effective exchange rate, GDP growth rate, Lagged	Defective institutions hurt country's capacity to export manufactured goods; causality runs from institutions to exports. Non-manufactured goods are not related to institutional quality

	with total exports		investment ratio to GDP; institutional quality (WGI) Control Independent Variables: Methodology: FE, RE and IV	
Mo, P. H. (2001). Corruption and Economic Growth. <i>Journal of Comparative Economics</i> . 29, 66–79	Question: The impact of corruption on the growth and importance of the transmission channels	Model: (N/A)	Data: Cross-section with 46 countries, between 1970-1985 Dependent Variable: Growth rate Central Independent Variable: The corruption index Control Indep.Variables: Ratio of private investment to GDP, The initial per capita income, Political rights, Average schooling, Measure of political instability, Population growth. Methodology: OLS	The most important channel through which corruption affects economic growth is political instability, which accounts for about 53% of the total effect
Paldam, M.	Question:	Model: (N/A)	Data: Cross-section with 100 countries	(1) The most important

(2002). The Cross-Country Pattern of Corruption: Economics, Culture and the Seesaw Dynamics. <i>European Journal of Political Economy</i> . 18.2, 215-240	Which one explains corruption: Cultural factors or economic factors?		Dependent Variable: Corruption (TI) Independent Variables: Economic factors (GDP per capita, growth, inflation, regulation, gini coefficient); Cultural factors (dummies for West Europe, Latin America, old communist, Africa, orient, democracy); and culture-GDP pc interactions Methodology: OLS	determinant of corruption is GDP per capita. (2) The transition from a poor traditional country to a wealthy liberal democracy includes a dramatic reduction in the level of corruption. (3) Countries are more similar in GDP level than in the level of corruption within the same cultural area. Culture is thus an inferior explanation of the level of corruption. Corruption varies greatly within the same cultural area.
Rivera-Batiz, F. L. (2002). Democracy, Governance, and Economic Growth: Theory and Evidence.	Question: What components of democracy help to control corruption and are the relationship linear?	Model: (N/A)	Data: Cross-section with 69-97 countries Dependent Variable: Corruption index (KKZ) Central Independent Variable: Political	Democracy reduces corruption, but the relationship is U-shaped. Civil liberties matter more than other forms.

<i>Review of Development Economics.</i> 6.2, 225-247			rights, Civil liberties, Separation of powers Control Independent Variables: Development level, openness, culture Methodology: OLS	
Sandholtz, W. and W. Koetzle. (2000). Accounting for Corruption: Economic Structure, Democracy and Trade. <i>International Studies Quarterly.</i> 44, 31-50.	Question: Explain variation in corruption depending on several institution-related, demographic, cultural and trade factors	Model: (N/A)	Data: 50 country cross-section Dependent Variable: Corruption Perceptions Index (TI) Central Independent Variables: GDP per capita, Trade ratio to GDP, Economic freedom (FH), Democracy, Democratic years Control Variables: Log total GDP, British colony dummy, Percent Protestant Methodology: Multi-variate OLS	Levels of corruption are higher: (1) Lower the average income level; (2) greater the state control over economy; (3) weaker the democratic norms and institutions; (4) lower the openness to trade; and (5) lower the share of population with Protestant religious affiliation
Treisman,	Question: The	Model: (N/A)	Data: Cross-section with 41-64	Countries with Protestant

D. (2000). The Causes of Corruption: A Cross National Study. <i>Journal of Public Economics</i>. 76, 399-457	causes of corruption		countries Dependent Variable: Corruption indices (TI, BI) Central Independent Variable: Legal origin, Colonial past, Federalist structure, Democracy, Culture, Wages, GDP, Political stability, Government intervention, Openness, Natural resources, Ethnic differences Methodology: OLS	traditions, histories of British rule, more developed economies, and (probably) higher imports are less corrupt. Federal states are more corrupt. While the current degree of democracy is not significant, long exposure to democracy predicts lower corruption.
Wei, S. J. (2000). Natural Openness and Good Government. <i>World Bank Working Paper</i>	Question: How does openness affect corruption?	Model: (N/A)	Data: Cross-section with 64-80 countries Dependent Variable: corruption (BI, TI) Central Independent Variable: Natural openness (predicted by remoteness, population,	Naturally open countries are less corrupt than others. Residual openness (i.e. trade policies) is not as important.

No. 2421			coast length, landlocked dummy, language dummy), Residual openness (difference between natural openness and trade/GNP) Control Independent Variables: Democracy, Federalism, Decentralization, Development level, Ethnic differences Methodology: OLS	
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3. EMPIRICAL ANALYSIS

3.1. Basic Motivation and Methodology

Baier and Bergstrand (2001) and Baier et al. (2006) open up a space for further investigation of the role of institutions and geography in international trade. Moreover, Anderson and Yotov (2009) provides sufficient reasoning of the institutional elements that are evolving over time –unlike the country specific geographical elements which are meaningful for the cross-sectional analysis- to proxy for the reduction in trade costs. Grossman and Helpman (1994) on the other hand lead the way towards a powerful conjecture on the interplay of institutional elements that are effective on policy-making and governance; and international trade (protection or liberalization). Many other scholarly works underline the importance of institutional variables in determining trade, or vice versa. The two are often entering into equations of growth as there is an ongoing controversy over their comparative roles in determining the level of income or income differences.

Segura-Cayuela (2006) provides a detailed theoretical model of inefficient institutions, specifically for developing countries. He constructs a model in which trade openness leads to worse economic policies given the weak institutional base. The reasoning behind is that the general equilibrium price effects of taxation and expropriation hurt all of the society, including the elite in closed economies. Opening up for trade however removes that sort of barrier against inefficient institutions. Followed by another essay on how the elites' factor endowments shape weak political regimes, Segura-Cayuela (2006) points out that the elites often tend to distort the sectors that use factors they own intensively, less than the rest of the economic sectors. By using an econometric analysis with a panel of 92 countries and 17 years, Segura-Cayuela (2006) concludes that non-democratic regimes that trade more face with more of expropriation while this not being the case for democratic regimes. The methodology that makes use of panel setting will also be present at our analysis as we extend the scope of our view of governance indicators to a set of categories.

3.1.1. The Structure of the Problem

The problem of trade and governance relationship could well be defined as a statistical relationship, as stated by Anderson (1979; 2009). With the use of gravity equation, the functional form could well be extended to capture geographical components that might either facilitate or make it even more difficult to trade. The functional form itself is relaxed to become a CES form throughout the literature, which is clearly a later-on departure from standard Cobb-Douglas assumptions. The basic form of a gravity equation contains trade variables, GDPs, country size and population. Distance between the home country and the partner has also been one of the critical elements in defining the gravity equation.

Besides the game-theoretic approach (as in Grossman and Helpman [1994]) to the problem of determinants of trade openness and protection, the intrinsic type of lobbying actions in developed economies, there is almost no general framework to address the relation between trade policies and determinants in developing countries. Levchenko (2004) underlines the importance of the game theoretic approach to provide a model for understanding the dynamics as he also provides an empirical analysis while an empirical attempt to reveal the behind the scene dynamics that cause differences in trade volumes has not been carried out in a detailed fashion. The so-called “root causes” as stated by Acemoglu et al. (2005) of trade dynamics could well lie in institutional basis which are best reflected in governance indicators. Our analysis however does not limit itself to a single or group of governance indicators (as in Azarbayjani et al. [2010]) to be effective on trade policy, but it rather considers any type of governance indicator to be related to another and therefore we argue in this dissertation that the aggregated groups of governance variables are more effectively revealing in terms of trade dynamics.

This section that utilizes an augmented gravity equation-based analysis will also include the distance variable, as the great circle distance, calculated by the author himself. The rest of the gravity equation comprises of relevant dummy variables – mostly being geographic or institutional based. There are two broad lines of research that employ either both elements; or geographical dummies only; or institutional basis

(i.e. colonial past, legal origin, democracy etc.) only. Our study will incorporate both to see relative effects while additionally providing a comparison within the governance indicators as we will categorize them into three: i) administrative quality, ii) political stability and iii) public accountability.

Due to the structure of our data subject to analysis, panel data is preferred over cross-sectional analysis. Since it has both cross-section and time dimensions, panel data estimation is expected to reveal detailed explanations on both country-specific and time-varying effects. Therefore, before proceeding to the empirical analysis, the following sub-section will provide a short overview of the relevant technique employed in the analysis; namely the panel data estimation.

3.1.2. Panel Data Analysis: A Statistical Brief

A short overview on the statistical structure of the panel data, based on Greene (2004) and Warner (2005), is provided in this sub-section. Accordingly, panel models are models in which N cross-section units (e.g., individuals, cities, and countries) are observed over T time periods (in a ‘balanced’ panel). Consider the model $y_{it} = \beta' x_{it} + w_{it}$ where $i = i^{\text{th}}$ cross-section unit and $t = t^{\text{th}}$ time period. In this equation for y_{it} , x_{it} is a $k \times 1$ vector of variables affecting y_{it} (but does not include a 1 for intercept) and β is a $k \times 1$ parameter vector (*excluding* an intercept parameter). The model can be written in matrix form as:

$$\begin{bmatrix} Y_1 \\ Y_2 \\ \dots \\ Y_N \end{bmatrix} = \begin{bmatrix} X_1 \\ X_2 \\ \dots \\ X_N \end{bmatrix} \beta + \begin{bmatrix} w_1 \\ w_2 \\ \dots \\ w_N \end{bmatrix}.$$

In this form, Y_i is the $T \times 1$ vector of observations on the i th cross-section unit, X_i is $T \times k$, β is $k \times 1$, and w_i is a $T \times 1$ vector of residuals. The t^{th} row of X_i is the $1 \times k$

vector x'_{it} . Whether balanced or unbalanced, the advantages of panel data could be briefed from Greene (2004) as follows:

- i) The ability to reveal time and individual variation in data behavior which is unobservable in cross sections or aggregate time series
- ii) Panel data incorporates observable and unobservable individual heterogeneity
- iii) Provides rich hierarchical structures
- iv) Enables to understand dynamics in economic behavior.

Unobserved individual effects in regression: $E[y_{it} | x_{it}, c_i]$ and Linear specification is as follows (Greene, 2004):

Fixed Effects: $E[c_i | X_i] = g(X_i)$; effects are correlated with included variables.

Common: $\text{Cov}[x_{it}, c_i] \neq 0$;

Random Effects: $E[c_i | X_i] = \mu$; effects are uncorrelated with included variables. If X_i contains a constant term, $\mu=0$ WLOG. Common: $\text{Cov}[x_{it}, c_i] = 0$, but $E[c_i | X_i] = \mu$ is needed for the full model.

Main Issue in Models with Panel Data: Structure of w_{it} (i.e. residuals)

1. Completely Random Errors (CRE): w_{it} is completely random $\rightarrow w_{it} = \varepsilon_{it}$, $E(\varepsilon_{it}) = 0$, $V(\varepsilon_{it}) = \sigma^2_{\varepsilon}$.

2. Fixed Effects (FE) Models:

(a) One-Way Fixed Cross-Section Effects: $w_{it} = \alpha_i + \varepsilon_{it}$

(b) Fixed Time Effects: $w_{it} = v_t + \varepsilon_{it}$

(c) Two-Way Fixed Effects: $w_{it} = \alpha_i + v_t + \varepsilon_{it}$

α_i = fixed cross-section effect that captures net effect of omitted factors that vary over the cross-section units but are constant over time within cross-section units (by assumption)

v_t = a common shock that happens to all cross-section units at time t

ε_{it} = random (idiosyncratic) shock to cross-section unit i at time t

3. Random Effects (RE) Models (Error Components or Variance Components Models)

(a) One Way: $w_{it} = u_i + \varepsilon_{it}$

(b) Two-Way: $w_{it} = u_i + v_t + \varepsilon_{it}$

The u 's and v 's are not treated as fixed but are assumed to be truly random factors related to individual cross-section units or time and follow pdf's. In the random effects framework, cross-section unit i 'draws' a u_i from the pdf $f(u)$ and then is assigned this value for all periods for which it is observed. In the one way model, $E(\varepsilon_{it}) = E(u_i) = 0$, $E(\varepsilon_{it}^2) = \sigma_\varepsilon^2$, and $E(u_i^2) = \sigma_u^2$. The two-way random effects model adds the assumptions that $E(v_t) = 0$, $E(v_t^2) = \sigma_v^2$, and that u , v , and ε are uncorrelated (Warner, 2005).

Properties of OLS in Panel Models

1. If w_{it} is CRE, then OLS is unbiased and efficient.
2. If w_{it} follows one of the FE structures, then OLS is unbiased (and consistent) if and only if included regressors (X_{it}) are uncorrelated with either the omitted cross-section effects (α_i) or time effects (v_t).
3. If w_{it} follows a RE structure, then OLS is unbiased as long as X_{it} is uncorrelated with u_i or v_t . However, if the error structure is a RE structure, OLS is not fully efficient (shown below).

Models with One-Way Fixed Effects

Considering the one-way FE model $y_{it} = \beta' x_{it} + \alpha_i + \varepsilon_{it}$; one could derive the fixed effects through the following methods:

1. Least Squares with Dummy Variables (LSDV)

The methodology implies that we should simply include a dummy variable for each cross-section unit. The model for the i th cross-section unit is

$$y_i = i\alpha_i + X_i\beta + \varepsilon_i;$$

where i is an $N \times 1$ vector of 1's. Pooling all N cross-section units together, the model can be written as

$$Y = D\alpha + X\beta + \varepsilon \quad \text{where} \quad Y = \begin{bmatrix} y_1 \\ y_2 \\ \dots \\ y_N \end{bmatrix}, \quad D = \begin{bmatrix} i & 0 & \dots & 0 \\ 0 & i & \dots & 0 \\ 0 & 0 & \dots & 0 \\ 0 & 0 & \dots & i \end{bmatrix} \quad \text{is an } (N \times T) \times N$$

matrix, and α is an $N \times 1$ vector containing $\alpha_1, \alpha_2, \dots, \alpha_N$. The LSDV estimator of β can be shown to be $b = [X' M_d X]^{-1} [X' M_d Y]$ where $M_d = I - D(D'D)^{-1}D'$.

where

$$M_d = \begin{bmatrix} M^0 & 0 & \dots & 0 \\ 0 & M^0 & \dots & 0 \\ 0 & 0 & \dots & 0 \\ 0 & 0 & \dots & M^0 \end{bmatrix} \quad \text{where } M_{T \times T}^0 = I_T - i_T i_T' / T.$$

M^0 is an idempotent matrix where; $M^0 = M^0 * M^0$. Furthermore, M_d is idempotent. As a result, you can view the formula for b as a regression of $Y^* = M_d Y$ on $X^* = M_d X$. This is just a regression of **transformed** Y 's on **transformed** X 's where the transformation matrix is M_d . Consider the transformation of Y :

$$M_d Y = \begin{bmatrix} M^0 & 0 & \dots & 0 \\ 0 & M^0 & \dots & 0 \\ 0 & 0 & \dots & 0 \\ 0 & 0 & \dots & M^0 \end{bmatrix} \begin{bmatrix} Y_1 \\ Y_2 \\ \dots \\ Y_N \end{bmatrix} = \begin{bmatrix} M^0 Y_1 \\ M^0 Y_2 \\ \dots \\ M^0 Y_N \end{bmatrix}.$$

Each term in the last expression is a $T \times 1$ vector whose t^{th} element is $y_{it} - \bar{y}_{i\bullet}$, where $\bar{y}_{i\bullet}$ is the average value of Y in cross-section i . Analogously, the i, t element of $M_d X$ is $x_{it} - \bar{x}_{i\bullet}$, $i = 1, \dots, N$ and $t = 1, \dots, T$.

All the above matrices imply that b is estimated by a regression in which “deviated” Y_{it} is regressed on “deviated” X_{it} . The fixed effects (α_i) are simply intercepts for the different cross-section units. They are estimated as $\alpha_i = \hat{\alpha}_i = \bar{y}_{i\bullet} - b' \bar{x}_{i\bullet}$.

The residuals then are:

$$\begin{aligned} e_{it} &= y_{it} - \alpha_i - x'_{it} b \\ &= y_{it} - (\bar{y}_{i\bullet} - \bar{x}'_{i\bullet} b) - x'_{it} b \\ &= (y_{it} - \bar{y}_{i\bullet}) - (x_{it} - \bar{x}_{i\bullet}) b \end{aligned}$$

Therefore, the residual is decomposed into (1) the deviation of y_{it} from the average value of y for group i and (2) the part due to the effect of deviations of the x 's from the average value of x within group i . This residual decomposition will be useful below. The variance of b and the α_i is as follows:

$$V(b) = \hat{\sigma}^2 (X' M_d X)^{-1} = \hat{\sigma}^2 (X' M_d X)^{-1} \text{ where } \hat{\sigma}^2 = s^2 = \sum_{i=1}^N \sum_{t=1}^T \frac{(Y_{it} - \alpha_i - x'_{it} b)^2}{NT - N - K}$$

and x'_{it} represents the $1 \times k$ vector of observations on the independent variables in cross-section i at time t .

$$\text{The variances of } \alpha_i \text{ are given by } V(\alpha_i) = \frac{\sigma^2}{T} + \bar{x}'_{i\bullet} V(b) \bar{x}_{i\bullet}.$$

2. “Within” and “Between” Estimators

Given the model as $y_{it} = \beta' x_{it} + \alpha_i + \varepsilon_{it}$; the average value of Y within group i becomes: $\bar{y}_{i\bullet} = \beta' \bar{x}_{i\bullet} + \alpha_i + \bar{\varepsilon}_{i\bullet}$. Subtracting the second equation from the first gives $(y_{it} - \bar{y}_{i\bullet}) = \beta'(x_{it} - \bar{x}_{i\bullet}) + (\varepsilon_{it} - \bar{\varepsilon}_{i\bullet})$

This model says that deviations in Y from Y's group means $(y_{it} - \bar{y}_{i\bullet})$ are related to deviations in X from X's group means $(x_{it} - \bar{x}_{i\bullet})$ plus the random error $(\varepsilon_{it} - \bar{\varepsilon}_{i\bullet})$. Therefore, to estimate β we can just construct the deviated Y's and X's and regress $(y_{it} - \bar{y}_{i\bullet})$ on $(x_{it} - \bar{x}_{i\bullet})$. The process of deviating Y and X from their respective cross-section unit means eliminates the fixed effects (the α_i 's) from the model.

The estimate of β derived by regressing $(y_{it} - \bar{y}_{i\bullet})$ on $(x_{it} - \bar{x}_{i\bullet})$ is called the “within” estimator because it uses variation in X **within** the cross-section units to identify the effect of X on Y. Obviously, the quality of the “within” estimator depends on the amount of **idiosyncratic** variation in X within the cross-section units.

The “between” estimator of β can be obtained by estimating the model $\bar{y}_{i\bullet} = \beta' \bar{x}_{i\bullet} + \bar{w}_{i\bullet}$. This regression will have N observations. Here, the estimate of β is based on variation in the average value of X **across** the cross-section units (Warner, 2005).

3. The Relationship Between the OLS, Within, and Between Estimators

Recalling that x_{it} is a k x 1 vector of variables affecting y_{it} , we may define the following matrices and vectors of sums of squares and cross-products between the X's and between the X's and Y:

$$S_{xx}^t = \sum_{i=1}^N \sum_{t=1}^T (x_{it} - \bar{x})(x_{it} - \bar{x})' = \text{a k x k matrix}$$

$$S_{xy}^t = \sum_{i=1}^N \sum_{t=1}^T (x_{it} - \bar{x})(y_{it} - \bar{y})' = \text{a k x 1 vector}$$

$$S_{xx}^w = \sum_{i=1}^N \sum_{t=1}^T (x_{it} - \bar{x}_{i\bullet})(x_{it} - \bar{x}_{i\bullet})' = \text{a } k \times k \text{ matrix}$$

$$S_{xy}^w = \sum_{i=1}^N \sum_{t=1}^T (x_{it} - \bar{x}_{i\bullet})(y_{it} - \bar{y}_{i\bullet})' = \text{a } k \times 1 \text{ vector}$$

$$S_{xx}^b = \sum_{i=1}^N T(\bar{x}_{i\bullet} - \bar{\bar{x}})(\bar{x}_{i\bullet} - \bar{\bar{x}})' = \text{a } k \times k \text{ matrix}$$

$$S_{xy}^b = \sum_{i=1}^N T(\bar{x}_{i\bullet} - \bar{\bar{x}})(\bar{y}_{i\bullet} - \bar{\bar{y}})' = \text{a } k \times 1 \text{ vector}$$

S_{xx}^t shows the total variation in X around the grand means of X in the data.

S_{xx}^w shows the variation of X within the cross-section units and S_{xx}^b shows the variation in X between the cross-section units. The total variation in X is the sum of the “within” variation and the “between” variation:

$$S_{xx}^t = S_{xx}^w + S_{xx}^b$$

Similarly, the total joint variation between X and Y can be decomposed into the sum of the variation within the cross-section units and variation between the units:

$$S_{xy}^t = S_{xy}^w + S_{xy}^b$$

Using these definitions, the three different estimators of β are:

$$\text{OLS: } b^t = [S_{xx}^t]^{-1} S_{xy}^t$$

$$\text{Within: } b^w = [S_{xx}^w]^{-1} S_{xy}^w$$

$$\text{Between: } b^b = [S_{xx}^b]^{-1} S_{xy}^b$$

Since $S_{xx}^t = S_{xx}^w + S_{xx}^b$, $S_{xy}^w = S_{xx}^w b^w$, and $S_{xy}^b = S_{xx}^b b^b$, however, the OLS estimator of β becomes: $b^t = F^w b^w + F^b b^b$

where $F^w = [S_{xx}^w + S_{xx}^b]^{-1} S_{xx}^w$ and $F^b = I - F^w$.

The OLS estimator is simply a weighted average of the “within” and “between” estimators of β . The weighting factor F^w is just the fraction of the total variation in X that is due to variation **within** cross-section units. (F^b is the fraction of the variation in X due to variation **between** cross-section units.)

When the question comes to the properties of b^t , b^w , and b^b , one should take a comparative approach. Since the error term in the original one-way fixed effect model is $w_{it} = \alpha_i + \varepsilon_{it}$, OLS will be unbiased only if the included variables are uncorrelated with the α_i . Otherwise, OLS is biased (and inconsistent). When we deviate the data from group means to compute the “within” estimator b^w , the error term in the “deviated” model is $(\varepsilon_{it} - \bar{\varepsilon}_{i\bullet})$. Since this error has been purged of α_i and is uncorrelated with x_{it} (by assumption), then the “within” estimator b_w will be unbiased and inconsistent (Warner, 2005).

The error in the “between” model is $\bar{w}_i = \alpha_i + \bar{\varepsilon}_{i\bullet}$. Since this error has not been purged of α_i , b^b is biased if x_{it} is correlated with α_i .

Models with Two-Way Fixed Effects

TWFE models are just a generalization of one-way fixed effects models. Consider the model $y_{it} = \beta' x_{it} + \alpha_i + v_t + \varepsilon_{it}$. The cross-section effects can be handled by including dummy variables for the cross-section units and dummy variables for time periods. Since it becomes intractable when N and T are large, one could eliminate the fixed effects by deviating all observations from cross-section and time means: $y_{it}^* = y_{it} - \bar{y}_{i\bullet} - \bar{y}_{\bullet t} + \bar{\bar{y}}$ and $x_{it}^* = x_{it} - \bar{x}_{i\bullet} - \bar{x}_{\bullet t} + \bar{\bar{x}}$.

Random Effects Models

It is often questioned in the literature how the fixed effect α is different from the random effect u . It is however claimed that random effects models apply when the cross-section units (e.g., individuals) are drawn from a larger population that might be

resampled in the future. One should derive the RE estimator and show how it differs from the FE model. A Hausman test can distinguish between them in actual applications.

Let's consider the one-way RE model:

$$y_{it} = \mu + \beta' x_{it} + w_i = \mu + \beta' x_{it} + u_i + \varepsilon_{it}$$

Let's assume that x_{it} is independent of w_{it} . If this assumption holds, OLS is in fact unbiased. But is it efficient? The answer is no. To show this, let $w_i = [w_{i1} \ w_{i2} \ \dots \ w_{iT}]'$ be the $T \times 1$ vector of residuals for cross-section unit i . Since u and ε are uncorrelated random variables,

$$V(w_{it}) = V(u_i) + V(\varepsilon_{it}) = \sigma_u^2 + \sigma_\varepsilon^2.$$

$$\text{Moreover, } E(w_{it} w_{is}) = \sigma_u^2 \text{ for } t \neq s.$$

Let's now consider now the $T \times T$ covariance matrix of w_i : $E(w_i w_i') = \Sigma$. The t^{th} diagonal element of Σ is the variance of w_i , which we know to be $\sigma_u^2 + \sigma_\varepsilon^2$. The off-diagonal elements are all equal to σ_u^2 . Write this as $\Sigma = \sigma_\varepsilon^2 I_T + \sigma_u^2 i_T i_T'$. This covariance matrix exhibits a form of autocorrelation since, within a given cross-section, the residuals are not independent.

In the case of constructing the whole model as $Y = X\beta + W$ where the residual vector W is $NT \times 1$. The covariance matrix of W is $\Omega = E(WW')$ and is $NT \times NT$. Then, V will be a block-diagonal matrix of the form

$$\Omega = \begin{pmatrix} \Sigma & 0 & \dots & 0 \\ 0 & \Sigma & \dots & 0 \\ \dots & \dots & \dots & \dots \\ 0 & 0 & \dots & \Sigma \end{pmatrix} = \Sigma \otimes I_n \quad (\text{The symbol } \otimes \text{ denotes Kronecker product.})$$

Since the form of the covariance matrix of W is known, the model could be estimated by GLS as $b_{RE} = (X' \Omega^{-1} X)^{-1} (X' \Omega^{-1} Y)$. The estimates of σ_u^2 and σ_ε^2 are needed. With estimates of these variances, we can form Σ and Ω and compute b_{RE} .

We could have more insight into RE estimation as follows. It is already clear how to obtain b_{RE} by finding “transformed” Y (Y^*) and “transformed” X (X^*) and then regressing Y^* on X^* . From previous sub-sections, $Y^* = \Omega^{-1/2} Y$ and $X^* = \Omega^{-1/2} X$. Therefore;

$$\Omega^{-1/2} = I_N \otimes \Sigma^{-1/2} \text{ where } \Sigma^{-1/2} = \frac{1}{\sigma_\varepsilon^2} \left[I_T - \frac{\theta}{T} i_T i_T' \right] \text{ and } \theta = 1 - \frac{\sigma_\varepsilon^2}{\sqrt{T \sigma_u^2 + \sigma_\varepsilon^2}}.$$

This further implies that

$$Y_i^* = \Sigma^{-1/2} Y_i = \begin{bmatrix} y_{i1} - \theta \bar{y}_{i\bullet} \\ y_{i2} - \theta \bar{y}_{i\bullet} \\ \dots \\ y_{iT} - \theta \bar{y}_{i\bullet} \end{bmatrix} \text{ and } X_i^* = \Sigma^{-1/2} X_i = \begin{bmatrix} x_{i1} - \theta \bar{x}_{i\bullet} \\ x_{i2} - \theta \bar{x}_{i\bullet} \\ \dots \\ x_{iT} - \theta \bar{x}_{i\bullet} \end{bmatrix}.$$

These transformed variables look almost like the deviated variables from FE estimation. One should notice that as $\sigma_\varepsilon^2 \rightarrow 0$ then $\theta \rightarrow 1$. In such a case, the GLS transformation leads deviation in all observations from the group averages, and the RE estimator is the fixed effects estimator. However, as σ_ε^2 increases relative to σ_u^2 , $\theta \rightarrow 0$. When $\theta = 0$, the RE estimator is just OLS. The RE estimator is a blend of the OLS and FE estimators, where the transformation factor θ depends on the variance of u relative to the variance of ε . The RE estimator is also a weighted average of the “within” and “between” estimators as follows (Greene, 2004):

$$b_{RE} = \hat{F}^w b^w + (I - \hat{F}^w) b^b$$

$$\text{where } F^w = [S_{xx}^w + \lambda S_{xx}^b]^{-1} S_{xx}^w \text{ and } \lambda = \frac{\sigma_\varepsilon^2}{T \sigma_u^2 + \sigma_\varepsilon^2} = (1 - \theta)^2.$$

A. Steps in the Estimation of the RE Model

- a) Estimate the Fixed Effects Model and obtain the estimates of the fixed effects (the a_i) and the idiosyncratic residuals.
- b) Use these to estimate σ_u^2 and σ_ε^2 . (See previous section on one-way FE for the formula).
- c) Formulate $\hat{\theta} = 1 - \frac{\hat{\sigma}_\varepsilon}{\sqrt{T\hat{\sigma}_u^2 + \hat{\sigma}_\varepsilon^2}}$ and compute transformed Y's and transformed X's.
- d) Regress transformed Y on transformed X to get b_{RE} (including an intercept).
- e) Estimate the covariance matrix of b_{RE} as $V(b_{RE}) = (X'\Omega^{-1}X)^{-1}$.

B. Testing for Random Effects Versus Completely Random Errors

$$H_0: \sigma_u^2 = 0$$

$$H_A: \sigma_u^2 \neq 0$$

The test is a LaGrange Multiplier with test statistic

$$LM = \frac{NT}{2(T-1)} \left[\frac{\sum_{I=1}^n \left(\sum_{T=1}^T e_{it} \right)^2}{\sum_{I=1}^n \sum_{T=1}^T e_{it}^2} - 1 \right] = \frac{NT}{2(T-1)} \left[\frac{T^2 \bar{e}' \bar{e}}{e' e} - 1 \right] \text{ where } \bar{e} = [\bar{e}_1 \dots \bar{e}_N]'$$

Under the null hypothesis that $\sigma_u^2 = 0$, LM follows a χ^2_1 .

C. Testing For Fixed Versus Random Effects

If the cross-section effect u_i is uncorrelated with x_{it} , then the RE estimator of the parameter vector β is unbiased. Furthermore, theory tells us that since the RE

estimator is the GLS estimator, the RE estimator is efficient (has lower variance than other unbiased estimators). The RE estimator is therefore unbiased, consistent and linear efficient when u_i and x_{it} are uncorrelated. Now, the fixed effects estimator of β is unbiased whether or not the effect $u_i (= \alpha_i)$ is correlated with x_{it} . In cases where they are uncorrelated however, the FE estimator is not as efficient as the RE estimator. The Hausman test can therefore be used to distinguish the estimators.

H_0 : the RE estimator is consistent and efficient

H_A : the RE estimator is inconsistent.

The Hausman test trades off differences between the parameter estimates with differences in their variances. As usual;

$$H = (b_{RE} - b_{FE})' \Delta^{-1} (b_{RE} - b_{FE}) \quad \text{where } \Delta = V(b_{FE}) - V(b_{RE}).$$

Under the null hypothesis, $H \sim \chi^2_k$.

3.2. Data Overview

We have derived the essential data for our analysis from the following sources:

- Bilateral trade: United Nations Conference on Trade and Development (UNCTAD) database for the period of (1995-2009), 2010
- Gravity components (common border, common language, continental, latitude and longitude): Central Intelligence Agency (CIA) World Factbook, 2011
- FTA-PTA-CU: World Trade Organization (WTO), 2011
- GDP and population data: World Development Indicators (WDI), World Bank, 2010
- Governance indicators: Political Risk Services' (The PRS Group) International Country Risk Guide (ICRG), 2010 and Freedom House (FH) Political Rights and Civil Liberties indices (2010)

- Organization for Economic Cooperation and Development (OECD) for the membership data

While producing the master data set, we made use of several names to represent the constituent parts of the analysis. A brief list of variable names and other uses of indicators is as follows:

The term “exporter” stands for the exporting country while “importer” is used for the importing country. The variable name “trade” stands for the bilateral trade volume between a pair of countries for a given year (i.e., from 1995 to 2009). The “distance” variable is calculated via great circle distance method which required the use of the latitude and longitude of the trading countries as such: “lat_exp” and “lat_imp” stand for the latitude of exporter and importer countries, respectively while “long_exp” and “long_imp” indicate the longitude of exporter and importer countries. There, we computed the latitude and longitude values for the trading partners in radian terms, followed by the distance measures between them.

“Comlang”, “border”, “pta”, “cu”; “fta” and “landlocked” are dummies for the exporting and importing countries. They indicate whether the partner countries have official languages in common, shared borders, preferential or free trade agreements, or customs union; and if the exporting (importing) country is landlocked, respectively. The preferential, free trade or customs union agreement dummies are based on the World Trade Organization (WTO) definition. “Area” represents the country size of the exporting and importing countries, respectively while three additional dummies are created to stand for the countries located on the same continent, under the Organization for Economic Cooperation and Development (OECD) umbrella or belonging to the Middle East and North Africa (MENA) region.

Regional dummies come from Easterly’s (2001) fixed factors dataset, comprising Latin America and the Caribbean, East Asia and Pacific, East Europe and Central Asia, Middle East and North Africa, South Asia, West Europe, North America, Sub Sahara Africa. Other dummies for income levels (low-income; lower-middle income; upper-middle income; high-income OECD; and high-income non-OECD),

legal origin (British, French, Socialist, German, and Scandinavian), type of exporters (exporters of manufactured goods; oil exporting countries; exporters of services; diversified exporters and exporters of non-fuel primary goods), linguistic fractionalization and tropical climate are also from Easterly (2001). Data on colonies (British, French, Spanish, Portuguese and Belgian) and years of independence are also derived from the CIA's World Factbook.

Population data is derived from the World Bank's WDI database such alike the GDP values (constant USD in year 2000). The variable "tshare" refers to the ratio of exports volume to the GDP for each of the exporting country where it applies to the case of importer country as well. The rest is obviously the ICRG's political risk services data (2010) which consist of twelve indicators that are to be identified in the following sub-section; along with the Freedom House's Political Rights and Civil Liberties data (2010).

Below Table 3.1 provides the summary statistics for selected (or the most relevant) series in the data:

Table 3.1. Summary Statistics (Selected Series)

Variable	Observation	Mean	Std. Dev.	Min	Max
Trade	228067	541139.9	4656567	0	3.50e+08
Population	294700	4.30e+07	1.42e+08	193000	1.33e+09
GDP	279440	2.49e+11	9.97e+11	1.21e+08	1.15e+13
Distance	296100	7480.8	4328.36	113	19932
Common Lang	296100	0.12	0.32	0	1
Shared border	296100	0.023	0.15	0	1
FTA	296100	0.16	0.37	0	1
Landlocked	296100	0.16	0.37	0	1
Area	296100	903837.1	2201089	316	1.70e+07

3.2.1. Bilateral Trade

For the UNCTAD data, we made use of bilateral trade volumes by countries. Downloading and compiling the bilateral trade data for 141 countries that are also present in the governance indicator and geographical components data yielded a cross-sectional matrix of 141*140 while time dimension that goes from 1995 to 2009 also added a longitudinal aspect with 15 years of observations. Therefore a total of 296,100 observations with a significant number of variables constitute the whole dataset. The country codes from the UN-NBER bilateral trade data and UNCTAD data are harmonized and the UNCTAD coding is used as the benchmark. Trade share data is derived by simply taking the ratio of exports volume over GDPs. Below is the short information on the nature of UNCTAD dataset: Merchandise trade matrix, exports, annual, 1995-2009: the dataset provides the volume of merchandise trade by trading partner and product based on SITC, Rev. 3 commodity classification –with the 3-digit being the most detailed level, concerning international trade.

We used total commodity trade for the purpose of our study. Data is expressed in thousands of US Dollars where it is classified into geographical region and economic groupings for both the reporting (home) country and the partner; and last by the product grouping. The UNCTAD data is calculated on the basis of UN DESA Statistics Division, UN COMTRADE, IMF Direction of Trade Statistics (DOT); UNCTAD, UNCTADstat Merchandise Trade Indices; and UNCTAD, UNCTADstat Total Merchandise Trade. The principal data source for the bilateral trade however comes from UN DESA Statistics Division and UN COMTRADE that provide detailed raw data by trade partner and product. The IMF DOT database was costly enough to deter our efforts to obtain while constructing the bilateral trade master dataset via UNCTAD database took enormous amount of effort and time.

We did not attempt to go for any kind of extrapolation or interpolation since the UNCTAD database itself states that the gaps in the data were filled whenever it is appropriate and possible to do so. Trade figures are estimated in the absence of official data. The adjusted data or the estimates are marked to differentiate them from the

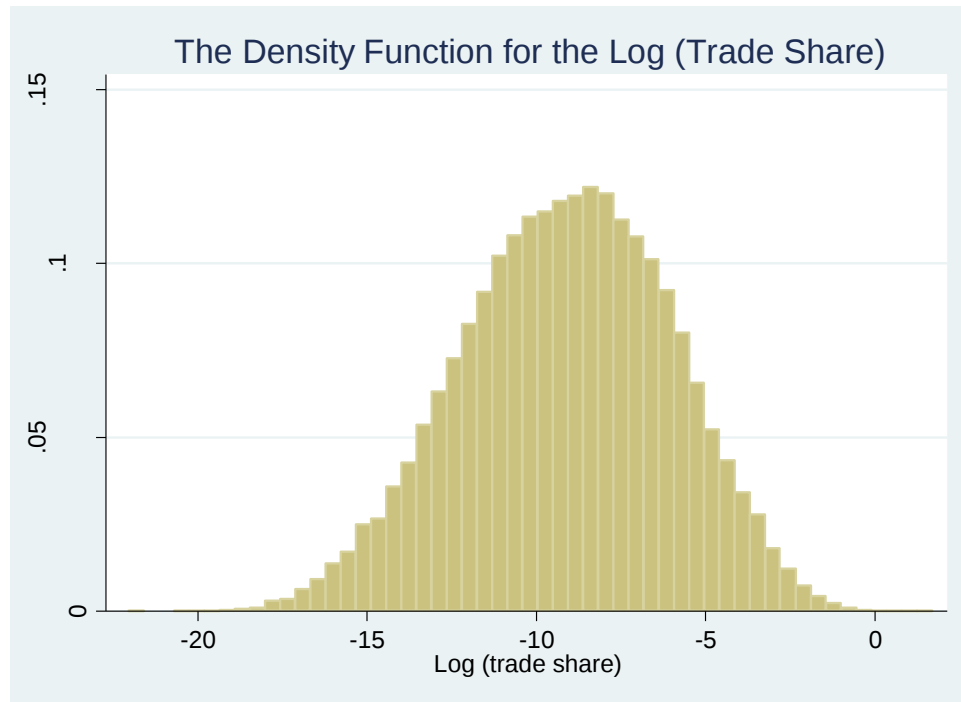
original data. For the set of 141 countries we use in the econometric analysis however, there is not a significant amount of missing data and our panel is strongly balanced.

“In addition, the sum of individual partners and the sum of individual products for a reporter may not add-up to its (total) trade to the world and its (total) trade of all products, respectively. Nevertheless, for user convenience, the differences between total trade and all detailed products are shown as a product group Unallocated which might have negative value, due to accumulated rounding during the calculation at the most detailed level.” (UNCTAD, 2011)

Despite the potential errors in the compilation of such a huge and detailed data, some checks are made to see whether countries’ total trade volumes are consistent with their total bilateral trade. It is quite evident that there is not much of an issue to discard the reliability of the data. Bilateral trade data before the period of 1995 is also compiled from the UN-NBER database for the period of 1984-1994. The original dataset covers the period of 1962 to 2000 while the relevant ones were previously compiled for the aim of our study since the ICRG’s governance indicators data has 1984 as the initial year of statistics. The inconsistency and the high number of missing values for the former Soviet Union countries made it less worthy for the purpose of this paper so the UN-NBER data for bilateral trade is not included in the study.

After constructing the bilateral trade data series that is exports volume; we have constructed another variable, namely trade share which was created simply dividing it by the GDPs. Trade share is used to estimate the gravity equation for a number of econometric-specification issues as well as the literature’s conventional methodology. Below is shown the density function for the logarithmic function of trade variable. It is crystal clear that the distribution seems normal:

Figure 3.1. The Density Function for the Log of Trade Share



3.2.2. Governance Indicators

We employ seven indicators from the International Country Risk Guide (ICRG) database while two additional variables from the Freedom House (FH) are also present in forming our governance data. As stated by the PRS group, the ICRG rating comprises 22 variables in three subcategories of risk: political, financial, and economic. A separate index is created for each of the subcategories. The Political Risk Rating – which is the only subgroup employed in the study- includes 12 weighted variables covering both political and social attributes. We made use of these weighted variables for the time interval of 1995 to 2009. The political risk indicators and their weights in the ICRG’s total political risk index are described in Table 3.2, below:

Table 3.2. ICRG Data Political Risk Components and Weights

Sequence	Component	Points (max.)
A (named as <i>govst</i> in our study)	Government Stability	12
B (named as <i>soc</i> in our study)	Socioeconomic Conditions	12
C (named as <i>inv</i> in our study)	Investment Profile	12
D (named as <i>iconf</i> in our study)	Internal Conflict	12
E (named as <i>econf</i> in our study)	External Conflict	12
F (named as <i>cor</i> in our study)	Corruption	6
G (named as <i>mil</i> in our study)	Military in Politics	6
H (named as <i>relig</i> in our study)	Religious Tensions	6
I (named as <i>law</i> in our study)	Law and Order	6
J (named as <i>ethnic</i> in our study)	Ethnic Tensions	6
K (named as <i>demacc</i> in our study)	Democratic Accountability	6
L (named as <i>burq</i> in our study)	Bureaucracy Quality	4
Total		100

The Political Risk Services' Data is used solely in order to figure out the effects of non-economic institutions on the bilateral trade performances among countries. The ICRG data provides more insight into the governance perceptions and the time span goes far back to 1984 which includes the 1995-2009 period which is the basis for our empirical research.

The World Bank's Worldwide Governance Indicators (WGI) on the other hand provides data since 1996 and for some of the data it begins with 1998. Beside the time span it covers, the ICRG dataset has some other distinctive and more comprehensive features in capturing the governance indicators in many ways. Therefore, we chose the ICRG over WGI in terms of governance indicators. With the help of principal component and factor analysis, as implied by Aysan et al. (2011), we have used only 7 out of the total 12 ICRG indicators, added by the two indicators from the FH.

The categorization of the governance indicators are also made through factor analysis as it suggests that the ICRG data might well be decomposed into three categories: Administrative Quality (AQ), Political Stability (PS) and Public Accountability (PA).

The first one in our analysis is composed of Corruption, Bureaucratic Quality, and Law and Order from ICRG. The second broad category consists of ICRG's Government Stability, Ethnic Tensions and Internal Tensions; while the last category includes ICRG's Democratic Accountability, FH's Political Rights and Civil Liberties indicators. The following information on the structure and sources of ICRG and Freedom House variables provide useful overview to the governance indicators used in this study:

“The aim of the political risk rating is to provide a means of assessing the political stability of the countries covered by ICRG on a comparable basis. This is done by assigning risk points to a preset group of factors, termed political risk components. The minimum number of points that can be assigned to each component is zero, while the maximum number of points depends on the fixed weight that component is given in the overall political risk assessment. In every case the lower the risk point total, the higher the risk, and the higher the risk point total the lower the risk. To ensure consistency, both between countries and over time, points are assigned by ICRG editors on the basis of a series of pre-set questions for each risk component.

Government Stability – 12 Points

This is an assessment both of the government's ability to carry out its declared program(s), and its ability to stay in office. The risk rating assigned is the sum of three subcomponents, each with a maximum score of four points and a minimum score of 0 points. A score of 4 points equates to Very Low Risk and a score of 0 points to Very High Risk.

The subcomponents are:

- a) Government Unity*
- b) Legislative Strength*
- c) Popular Support*

Socioeconomic conditions – 12 Points

This is an assessment of the socioeconomic pressures at work in society that could constrain government action or fuel social dissatisfaction. The risk rating

assigned is the sum of three subcomponents, each with a maximum score of four points and a minimum score of 0 points. A score of 4 points equates to Very Low Risk and a score of 0 points to Very High Risk.

The subcomponents are:

- a) Unemployment*
- b) Consumer Confidence*
- c) Poverty*

Investment Profile – 12 Points

This is an assessment of factors affecting the risk to investment that are not covered by other political, economic and financial risk components. The risk rating assigned is the sum of three subcomponents, each with a maximum score of four points and a minimum score of 0 points. A score of 4 points equates to Very Low Risk and a score of 0 points to Very High Risk.

The subcomponents are:

- a) Contract Viability/Expropriation*
- b) Profits Repatriation*
- c) Payment Delays*

Internal Conflict – 12 Points

This is an assessment of political violence in the country and its actual or potential impact on governance. The highest rating is given to those countries where there is no armed or civil opposition to the government and the government does not indulge in arbitrary violence, direct or indirect, against its own people. The lowest rating is given to a country embroiled in an on-going civil war. The risk rating assigned is the sum of three subcomponents, each with a maximum score of four points and a minimum score of 0 points. A score of 4 points equates to Very Low Risk and a score of 0 points to Very High Risk.

The subcomponents are:

- a) Civil War/Coup Threat*
- b) Terrorism/Political Violence*
- c) Civil Disorder*

External Conflict – 12 Points

The external conflict measure is an assessment both of the risk to the incumbent government from foreign action, ranging from non-violent external pressure (diplomatic pressures, withholding of aid, trade restrictions, territorial disputes, sanctions, etc.) to violent external pressure (cross-border conflicts to all-out war). External conflicts can adversely affect foreign business in many ways, ranging from restrictions on operations to trade and investment sanctions, to distortions in the allocation of economic resources, to violent change in the structure of society. The risk rating assigned is the sum of three subcomponents, each with a maximum score of four points and a minimum score of 0 points. A score of 4 points equates to Very Low Risk and a score of 0 points to Very High Risk.

The subcomponents are:

- a) War*
- b) Cross-Border Conflict*
- c) Foreign Pressures*

Corruption – 6 Points

This is an assessment of corruption within the political system. Such corruption is a threat to foreign investment for several reasons: it distorts the economic and financial environment; it reduces the efficiency of government and business by enabling people to assume positions of power through patronage rather than ability; and, last but not least, introduces an inherent instability into the political process.

The most common form of corruption met directly by business is financial corruption in the form of demands for special payments and bribes connected with

import and export licenses, exchange controls, tax assessments, police protection, or loans. Such corruption can make it difficult to conduct business effectively, and in some cases may force the withdrawal or withholding of an investment.

Although our measure takes such corruption into account, it is more concerned with actual or potential corruption in the form of excessive patronage, nepotism, job reservations, 'favor-for-favors', secret party funding, and suspiciously close ties between politics and business. In our view these insidious sorts of corruption are potentially of much greater risk to foreign business in that they can lead to popular discontent, unrealistic and inefficient controls on the state economy, and encourage the development of the black market.

The greatest risk in such corruption is that at some time it will become so overweening, or some major scandal will be suddenly revealed, as to provoke a popular backlash, resulting in a fall or overthrow of the government, a major reorganizing or restructuring of the country's political institutions, or, at worst, a breakdown in law and order, rendering the country ungovernable.

Military in Politics – 6 Points

The military is not elected by anyone. Therefore, its involvement in politics, even at a peripheral level, is a diminution of democratic accountability. However, it also has other significant implications. The military might, for example, become involved in government because of an actual or created internal or external threat. Such a situation would imply the distortion of government policy in order to meet this threat, for example by increasing the defense budget at the expense of other budget allocations.

In some countries, the threat of military take-over can force an elected government to change policy or cause its replacement by another government more amenable to the military's wishes. A military takeover or threat of a takeover may also represent a high risk if it is an indication that the government is unable to function effectively and that the country therefore has an uneasy environment for foreign businesses. A full-scale military regime poses the greatest risk. In the short term a

military regime may provide a new stability and thus reduce business risks. However, in the longer term the risk will almost certainly rise, partly because the system of governance will become corrupt and partly because the continuation of such a government is likely to create an armed opposition. In some cases, military participation in government may be a symptom rather than a cause of underlying difficulties. Overall, lower risk ratings indicate a greater degree of military participation in politics and a higher level of political risk.

Religious Tensions – 6 Points

Religious tensions may stem from the domination of society and/or governance by a single religious group that seeks to replace civil law by religious law and to exclude other religions from the political and/or social process; the desire of a single religious group to dominate governance; the suppression of religious freedom; the desire of a religious group to express its own identity, separate from the country as a whole. The risk involved in these situations range from inexperienced people imposing inappropriate policies through civil dissent to civil war.

Law and Order – 6 Points

“Law and Order” form a single component, but its two elements are assessed separately, with each element being scored from zero to three points. To assess the “Law” element, the strength and impartiality of the legal system are considered, while the “Order” element is an assessment of popular observance of the law. Thus, a country can enjoy a high rating – 3 – in terms of its judicial system, but a low rating – 1 – if it suffers from a very high crime rate if the law is routinely ignored without effective sanction (for example, widespread illegal strikes).

Ethnic Tensions – 6 Points

This component is an assessment of the degree of tension within a country attributable to racial, nationality, or language divisions. Lower ratings are given to countries where racial and nationality tensions are high because opposing groups are

intolerant and unwilling to compromise. Higher ratings are given to countries where tensions are minimal, even though such differences may still exist.

Democratic Accountability – 6 Points

This is a measure of how responsive government is to its people, on the basis that the less responsive it is, the more likely it is that the government will fall, peacefully in a democratic society, but possibly violently in a non-democratic one. The points in this component are awarded on the basis of the type of governance enjoyed by the country in question. For this purpose, we have defined the following types of governance:

Alternating Democracy

The essential features of an alternating democracy are:

- a) A government/executive that has not served more than two successive terms,*
- b) Free and fair elections for the legislature and executive as determined by constitution or statute,*
- c) The active presence of more than one political party and a viable opposition,*
- d) Evidence of checks and balances among the three elements of government: executive, legislative and judicial,*
- e) Evidence of an independent judiciary,*
- f) Evidence of the protection of personal liberties through constitutional or other legal guarantees.*

Dominated Democracy

The essential features of a dominated democracy are:

- a) A government/executive that has served more than two successive terms,*

- b) *Free and fair elections for the legislature and executive as determined by constitution or statute,*
- c) *The active presence of more than one political party,*
- d) *Evidence of checks and balances between the executive, legislature, and judiciary,*
- e) *Evidence of an independent judiciary,*
- f) *Evidence of the protection of personal liberties.*

De Facto One-Party State

The essential features of a de facto one-party state are:

- a) *A government/executive that has served more than two successive terms, or where the political/electoral system is designed or distorted to ensure the domination of governance by a particular government/executive,*
- b) *Holding of regular elections as determined by constitution or statute,*
- c) *Evidence of restrictions on the activity of non-government political parties (disproportionate media access between the governing and non-governing parties, harassment of the leaders and/or supporters of non-government political parties, the creation of impediments and obstacles affecting only the non-government political parties, electoral fraud, etc.).*

De Jure One-Party State

The identifying feature of a one-party state is:

- a) *A constitutional requirement that there be only one governing party,*
- b) *Lack of any legally recognized political opposition.*

Autarchy

The identifying feature of an autarchy is:

a) *Leadership of the state by a group or single person, without being subject to any franchise, either through military might or inherited right. In an autarchy, the leadership might indulge in some quasi-democratic processes. In its most developed form this allows competing political parties and regular elections, through popular franchise, to an assembly with restricted legislative powers (approaching the category of a de jure or de facto one-party state). However, the defining feature is whether the leadership, i.e. the head of government, is subject to election in which political opponents are allowed to stand. In general, the highest number of risk points (lowest risk) is assigned to Alternating Democracies, while the lowest number of risk points (highest risk) is assigned to Autarchies.*

Bureaucracy Quality – 4 Points

The institutional strength and quality of the bureaucracy is another shock absorber that tends to minimize revisions of policy when governments change. Therefore, high points are given to countries where the bureaucracy has the strength and expertise to govern without drastic changes in policy or interruptions in government services. In these low-risk countries, the bureaucracy tends to be somewhat autonomous from political pressure and to have an established mechanism for recruitment and training. Countries that lack the cushioning effect of a strong bureaucracy receive low points because a change in government tends to be traumatic in terms of policy formulation and day-to-day administrative functions.

Assessing the Political Risk

In general terms if the points awarded are less than 50% of the total, that component can be considered as very high risk. If the points are in the 50-60% range it is high risk, in the 60%-70% range moderate risk, in the 70-80% range low risk and in the 80-100% range very low risk. However, this is only a general guideline as a better rating in other components can compensate for a poor risk rating in one component. Overall, a political risk rating of 0.0% to 49.9% indicates a Very High Risk; 50.0% to

59.9% High Risk; 60.0% to 69.9% Moderate Risk; 70.0% to 79.9% Low Risk; and 80.0% or more Very Low Risk. Once again, however, a poor political risk rating can be compensated for by a better financial and/or economic risk rating.” (ICRG, 2011)

The above paragraphs from the ICRG itself aim at providing an intuition on the relevance of the governance indicators in our analysis. Briefly put, the Freedom House indices are other sources of governance indicators that are intuitive. The Political Rights (PR) and the Civil Liberties (CL) indices are measured on a one-to-seven scale, with one representing the highest degree of Freedom and seven the lowest. Therefore, we make use of the Freedom House variables in the gravity equation with a negative sign before.

The administrative quality index (AQ) is a factor that reflects the government’s success in creating a trade-friendly business environment where the index components are all effective in assuring that. “Corruption” for instance is a significant factor that could impede economic activity while creating inefficient market structures. The “bureaucratic quality” also is an important factor to foster trade since the procedural processes imposed by the government might impede the velocity of transactions or make them costlier. “Law and order” index on the other hand is an indicator of secure business environment for the tradesmen and investors in general. The political stability index (PS) on the other hand includes “Government stability”, “Internal conflict” and “Ethnic tensions” variables which all are significantly determinant in explaining the political environment in a country. The more stable a country in terms of the political realm, the more it is predictable in the sense of business practices and investment decisions. Political instability on the contrary is an important source of uncertainty and possible unrest which in turn increases the vulnerability of the economy (Aysan et al., 2011). The public accountability index (PA) lastly composes of the ICRG’s “Democratic accountability” along with the Freedom House’s “Civil liberties” and “Political rights” variables. The index implies that the more credible and accountable a political regime is, the more attractive is its business infrastructure. More of public support to the political system in the country translates into a more productive business

environment as well. The principal component analysis (PCA) methodology, which is used to create these aggregated governance measures, is provided in the Appendix.

Figure 3.2. The Density Function for the GOV1 Variable

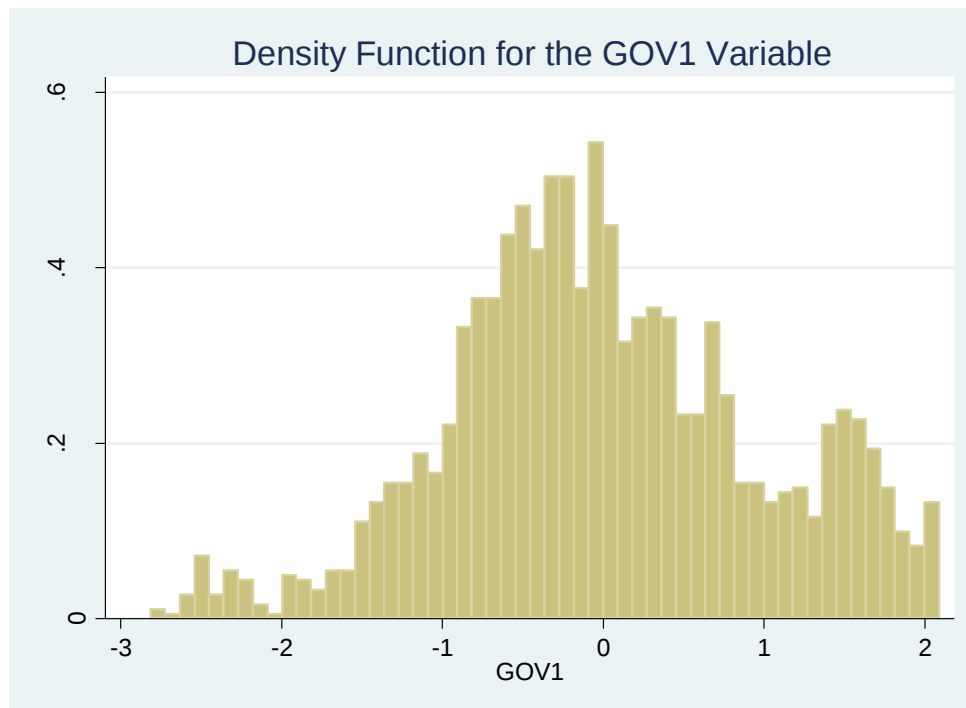
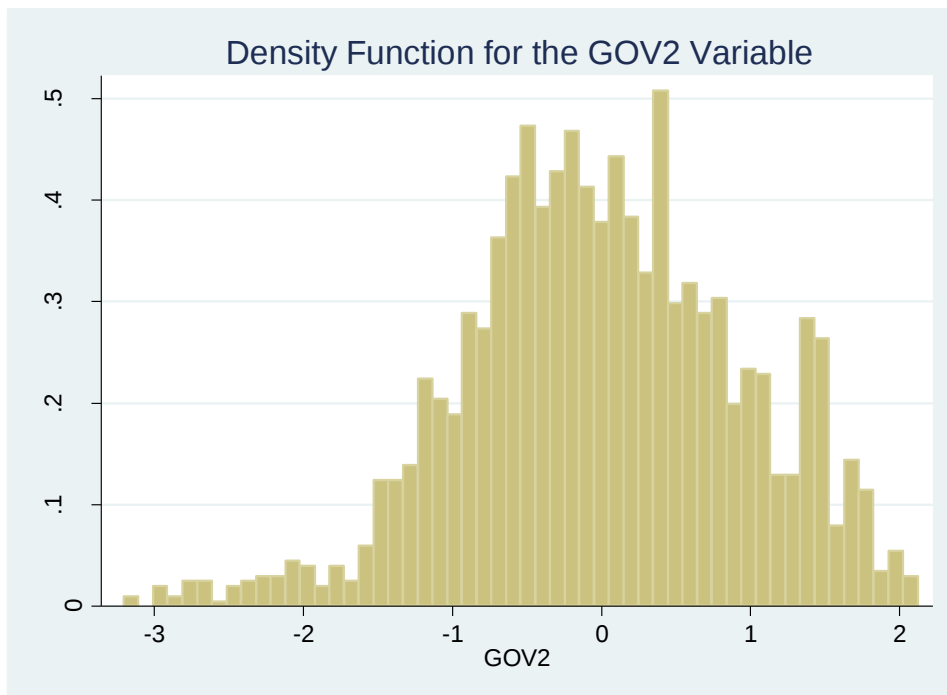


Figure 3.3. The Density Function for the GOV2 Variable



3.2.3. Standard and Extended Gravity Equation Variables

For the gravity equation components, the World Bank's WDI (2010) database is used as the GDP refers to the constant USD in year 2000. The distance between the trading countries in each pair is calculated by the great circle distance method. The longitude and latitudes of the countries made possible to calculate the distance, thanks to the CIA World Factbook data. Similarly, landlocked, common language (official; not spoken languages) and (land) border share dummies as well as the country size (area) data are derived from the CIA database. The WTO database provided the information on regional trade agreements (FTAs, PTAs and CUs).

The geographical or gravity components of the empirical model and data analysis come mostly from the CIA's World Factbook since it provides a comprehensive understanding of the individual countries such as their country size, languages (spoken and official), border shares, information on whether they are landlocked etc. the GDP and population data on the other hand come from the World Development Indicators (WDI, 2010) of the World Bank since the best alternative measure provided by the Penn World Table 6.3 has a time limitation that is goes up to

2007; and not beyond. Other relevant data for the gravity equation are the dummy variables which mostly come from Easterly (2001), CIA World Factbook (2011) –as stated in the previous sections.

3.3. Empirical Analysis

There are three main arguments on the trade-governance-growth inter-relationship: i) trade –which is usually instrumented by geography- determines the growth performance of the countries; ii) institutions proxied by governance indicators are far more effective in explaining income differences; and iii) trade and governance relationship is still ambiguous in terms of its direction. Therefore, there are some cases where simple causality tests are applied. These empirical analyzes usually tend to support the hypothesis that governance causes trade differentials. This dissertation is therefore yet another attempt to reveal the dynamics of trade, explained by a set of governance variables. For most of the literature, only a small proportion of such variables with different sources are employed. Factors such as protection of property rights, expropriation risk and corruption are among the most-intensively used. Our empirical study stems from the question over the relevance of political elements that are inductive or impeding countries' outward orientation. A comparison between a set of governance indicators and their classification is also aimed at in this study.

3.3.1. Governance-Trade Relationship

Based on the literature on governance and trade, theoretical and empirical studies carried out so far suggest that the institutions are almost always the “root causes” of long-run macroeconomic changes. A plausible argument in support of this strong assumption is that the underlying institutions in a country are determining the policy choices of households, agents and policy-makers altogether. A complex inter-relationship compound of all these actors yield an optimal solution –whether efficient or not- for each society. The mechanism through which institutions operate in determining

the macro variables are usually the policies (i.e. trade policy choices). For the purpose of our study however, the potential causality issue on the relationship between trade and governance should not be ambiguously left aside. In order to shed some light on the possible direction of the statistical specification, we employ a simple structured test of causality, provided below.

Since it is very difficult to find an appropriate causality test for panel data; literature has several different propositions to do so. One of the most common propositions is to difference the whole panel data set in order to yield single panels that allow for causality tests. Another methodology offered is to run sort of diagnostic tests via error correction models. Yet, another method that is also useful in STATA is to run Granger-causality test for both directions (of the two variables; trade share and governance in our case) in single panel units. Using the pair identification numbers, we have applied the test to several panel units to cross-check the validity of our results. To keep it short here and leave the rest of the test results into the Appendix, I will only present one of the several causality test results for the *AQ* variable which consists of corruption, bureaucratic quality and law and order *with trade share*. Iterating for more than 50 distinct panel units of bilateral trade, the Granger causality test suggested that the null hypothesis that *trade share* does not Granger cause the *AQ* variable is not rejected while the opposite is refuted. Therefore, we conclude that apart from the general convention and the empirical evidence from the literature, our simple test of Granger causality also supports the specification of our gravity model.

A Granger-causality test of trade-governance relationship with only one lag is provided as the results are shown in the below tables:

Table 3.3. Granger-Causality Test (*AQ* to *Trade Share*)

<i>Granger causality test</i>	Sample: 1996 to 2009
H0: <i>AQ</i> does not Granger-cause <i>trade share</i>	

F(1, 11) = 1.74
Prob > F = 0.2143

chi2(1) = 2.21 (asymptotic)
Prob > chi2 = 0.1370 (asymptotic)

No. of Observations: 14

Granger causality test

Sample: 1996 to 2009

H0: *trade share* does not Granger-cause AQ

F(1, 11) = 3.36
Prob > F = 0.0939

chi2(1) = 4.28 (asymptotic)
Prob > chi2 = 0.0386 (asymptotic)

Number of Observations = 14

3.3.2. Model with Extended Gravity Equation

Following the approach taken by Frankel and Romer (1999); Easterly and Levine (2003) and other studies in the literature; by taking the criticism of trade policy measures for trade variable into account, we will use geographical, institutional and other (i.e. historical) trade facilitating measures to estimate the actual trade share (ratio of exports volume to GDP) which would also provide an instrument for international trade. Empirical and model specifications of Anderson (1979; 2009), Baier et al. (2006) and McCallum (1995) provide a useful tool to employ the augmented gravity equation that incorporates both geography and institutions. A vast body of literature with or without using the gravity equation suggests evidences for the effect of trade openness on governance indicators. Whether positive or negative; significant or insignificant, this line of research depicts only one facet of the problem.

In this study however, a model that partially reverses the conventional wisdom over the relationship between governance indicators and openness is used. Contrary to

the vast body of literature on the linear or dynamic relationship between the first and the latter, we employ a model that seeks understanding of the effects of several or group of governance indicators –from ICRG and FH data- on openness at a multi-country setting. The extended bilateral trade equation for a pair of countries is:

$$\begin{aligned} \log(\text{trade share}) = & \alpha_0 + \alpha_1 \log(\text{gdp}) + \alpha_2 \log(\text{pop}) + \alpha_3 \log(\text{area}) + \\ & \alpha_4 \log(\text{distance}) + \alpha_5 \text{border} + \alpha_6 \text{comlang} + \alpha_7 \text{landlock} + \alpha_8 \text{dincome} + \\ & \alpha_9 \text{fta} + \alpha_{10} \text{dregion} + \alpha_{11} \text{doecd} + \alpha_{12} \text{dlegal} + \alpha_{13} \text{dexporttype} + \alpha_{14} \text{dcolony} + \\ & \alpha_{15} \text{dclimate} + \alpha_{16} \text{gov} + \varepsilon \end{aligned} \quad (1)$$

where *trade share* variable refers to bilateral trade share for a given year (i.e. 1995 to 2009); *gdp* values are GDPs of the countries in constant USD terms (2000); *pop* refers to the population of the exporter and importer countries for a given year; *area* is the country size in terms of sq-km(s); *distance* is the great circle distance between the trading countries in a given year; *border* is the common border dummy; *comlang* is the common language dummy; *landlock* is the dummy for the landlocked country; *dincome* is the dummy for the income level group of the trading country; *fta* is a dummy for the existence of an free trade agreement (FTA) between the countries; *dregion* is to capture the regional location of trading countries and *doecd* capture the OECD member country effect. Rest of the dummy variables are *dlegal*; *dexporttype*; *dcolony* and *dclimate* refer to the legal origin of trading countries, the type of exporter (i.e. fuel, non-fuel primary goods), the colonial origin and climate effect (i.e. being tropical or temperate), respectively. Last but not the least; *gov* variable corresponds to a set of governance indicators which are grouped according to their correlation levels.

The above specification of the gravity model is the most extensive one used in our estimations. We; however construct several distinct gravity equations to reflect the marginal contribution of each set of variables (i.e. geographical, institutional and historical) -which could be said to instrument actual trade share- on the share of exports. For simplicity, we assume the instrumental variables for size and other geographical variables along with the institutional variables not to have endogeneity or serial correlation problems. After setting up the bilateral trade measure, the trade share of

income for a country could be found by aggregating them. Therefore, the general form of equation (1) can be re-written as:

$$\ln(T_{ij} / GDP_i) = \theta' X_{ij} + e_{ij} \quad (2)$$

where θ is the vector of coefficients and X_{ij} is the vector of explanatory variables (1, $\log(gdp)$, $\log(pop)$, $\log(area)$,,) in the equation. Then the geography-institutions driven overall trade share of a country is:

$$\hat{\tau}_i = \sum_{j \neq i} e^{\theta' X_{ij}} \quad (3)$$

As indicated in the previous section 2.2 under the trade literature review; the existing body of literature has a significant number of studies making use of cross-sectional averages or starting values for time-series data. Such an approach to handle a large set of countries however is shown to bear two potential shortcomings. First, the use of cross-section data makes it impossible to control for unobserved country-specific differences, possibly biasing the results. Second, long-run averages or initial values for trade policy variables - particularly in developing countries - ignore the important changes which have occurred over time for the *same* country. Therefore we employ a panel setting in order to capture both time-varying and country-specific effects in a reasonably large group of countries as well as time span. Our panel setting includes data for 141 countries in terms of their bilateral trade, gravity components and governance indicators with their summary statistics shown in the below Table 3.3.

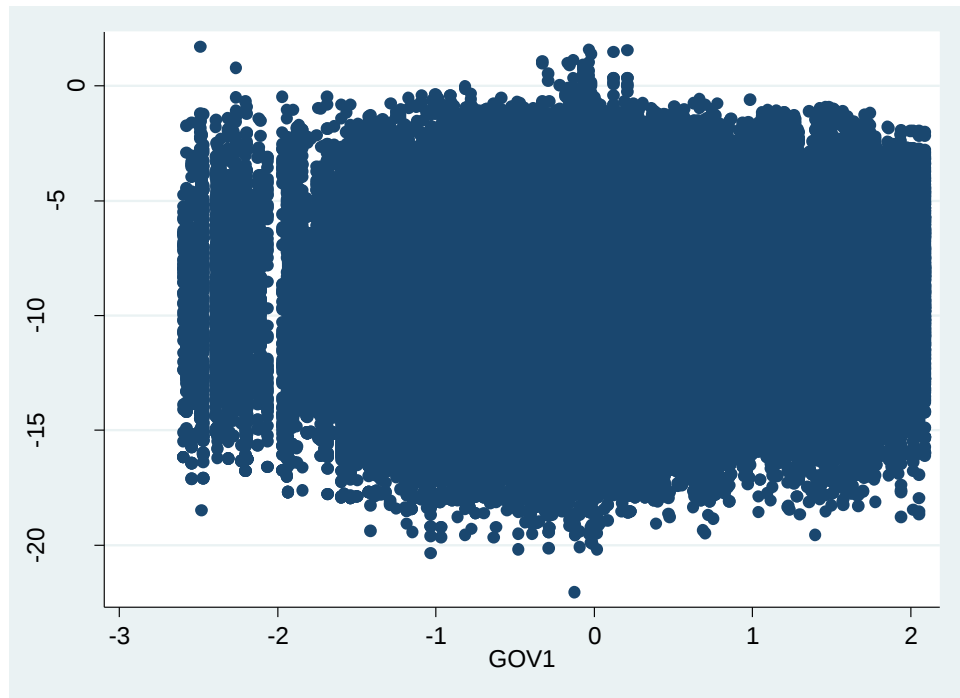
Table 3.4. Selected Summary Statistics in Panel

Variable		Mean	Std. Dev.	Min	Max	Observations
trade	overall	541139.9	4656567	0	3.50e+08	N = 228067
	between	39230910	2.41e+08	n = 18855		
	within	1650939-9.01e+07		1.42e+08	T-bar = 12.0958	
pop	overall	4.30e+07	1.42e+08	193000	1.33e+09	N = 294700
	between	1.41e+08	221732.4		1.28e+09	n = 19740

	within	7364666-7.10e+07	1.52e+08	T-bar = 14.9291		
gdp	overall	2.49e+11	9.97e+11	1.21e+08	1.15e+13	N = 279440
	between	9.79e+11	2.15e+08	1.00e+13	n = 19040	
	within	1.21e+11	-1.79e+12	1.76e+12	T-bar = 14.6765	
distance	overall	7480.797	4328.363	113	19932	N = 296100
	between	4328.465	113	19932	n = 19740	
	within	0	7480.797	7480.797	T = 15	
comlang	overall	.11692	.3213254	0	1	N = 296100
	between	.321333	0	1	n = 19740	
	within	0	.11692	.11692	T = 15	
border	overall	.0227964	.149254	0	1	N = 296100
	between	.1492575	0	1	n = 19740	
	within	0	.0227964	.0227964	T = 15	
fta	overall	.1598784	.3664939	0	1	N = 296100
	between	.3665025	0	1	n = 19740	
	within	0	.1598784	.1598784	T = 15	
landlocked	overall	.1631206	.3694763	0	1	N = 296100
	between	.369485	0	1	n = 19740	
	within	0	.1631206	.1631206	T = 15	
area	overall	903837.1	2201089316	1.70e+07		N = 296100
	between	2201141316	1.70e+07		n = 19740	
	within	0	903837.1	903837.1	T = 15	

A panel data setting is used for the aforementioned 141 countries in a time span from 1995 to 2009 as different models presented varying –and sometimes contradicting results. Linear, log-linear and semi-log forms of equations are respectively run (see Appendix). The preferred functional form however is the logarithmic (or the so-called *log-linear*) one due to the simplistic specifications of the gravity equation. The gravity model yielded makes use of the log of *trade share (ratio of bilateral exports to GDP)* as the dependent variable over independent variables: logs of GDP, population, country size (area), and distance while keeping the rest of the independent variables in their original form since they are either dummies or small-scale numbers which would turn out to be negative if logged.

Figure 3.4. The Scatter Plot of GOV1 Variable against Trade Share



Governance indicators are analyzed through principal component analysis (PCA) and factor analysis; and confirmed by the statistical packages STATA and SPSS together. Three broad categories with the all-9 governance indicators (*gov1*), the relevant 7 indicators of only the ICRG data (*gov2*) and the three broad categories of governance indicators, namely AQ, PS and PA are employed in the regressions. For the three groups of governance indicators, AQ is generated with bureaucratic quality, law and order and corruption indices. We named this as administrative quality indicator that is expected to be the most significant one. The political stability or the PS is generated through government stability, internal conflict and ethnic tensions indicators while the last sub-category public accountability or the PA incorporates democratic accountability, civil liberties and political rights indicators. Below tables from 3.5 through 3.9 provide a detailed description of the principal component analysis that is used as a tool for creating aggregated governance variables which constitute meaningful groups. Obviously we have created two set of governance variables, one for the home and another for the parent country.

Table 3.5. Administrative Quality Indicator (ICRG)

<i>Component</i>	<i>Eigenvalue</i>	<i>Cumulative R²</i>		
PC1	2.28	0.76		
PC2	0.39	0.89		
PC3	0.34	1		
Loadings		PC1	PC2	PC3
<i>Corruption</i>		0.58	-0.33	-0.74
<i>Law and Order</i>		0.57	0.82	0.09
<i>Bureaucracy Quality</i>		0.58	-0.47	0.66

$$AQ = PC1*(0.76) + PC2*(0.13) + PC3*(0.11)$$

Table 3.6. Political Stability Indicator (ICRG)

<i>Component</i>	<i>Eigenvalue</i>	<i>Cumulative R²</i>		
PC1	1.61	0.54		
PC2	0.94	0.85		
PC3	0.45	1		

Loadings	PC1	PC2	PC3
<i>Government Stability</i>	0.30	0.95	0.01
<i>Internal Conflict</i>	0.68	-0.21	-0.71
<i>Ethnic Tensions</i>	0.67	-0.22	0.71

$$PS = PC1*(0.54) + PC2*(0.31) + PC3*(0.15)$$

Table 3.7. Public Accountability Indicator (ICRG-FH)

Component	Eigenvalue	Cumulative R^2
PC1	2.39	0.80
PC2	0.54	0.98
PC3	0.07	1

Loadings	PC1	PC2	PC3
<i>Democratic Accountability</i>	-0.50	0.87	0.01
<i>Political Rights</i>	0.61	0.34	0.71
<i>Civil Liberties</i>	0.61	0.36	-0.70

$$PA = PC1*(0.80) + PC2*(0.18) + PC3*(0.02)$$

Table 3.8. GOV1 Indicator (ICRG-FH)

Component	Eigenvalue	Cumulative R^2
PC1	4.12	0.46
PC2	1.65	0.64
PC3	0.90	0.74
PC4	0.80	0.83
PC5	0.46	0.88
PC6	0.41	0.93
PC7	0.32	0.96
PC8	0.27	0.99
PC9	0.07	1

Loadings	PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8	PC9
<i>Government Stability</i>	0.02	0.43	-0.78	0.40	0.20	0.08	0.00	0.02	0.02
<i>Internal Conflict</i>	0.35	0.31	0.03	-0.26	0.24	-0.67	0.30	-0.33	0.03
<i>Corruption</i>	0.39	0.09	0.17	0.33	-0.37	0.39	0.58	-0.28	-0.02
<i>Law and Order</i>	0.37	0.35	0.16	0.10	-0.35	-0.22	-0.13	0.72	0.03
<i>Ethnic Tensions</i>	0.25	0.39	-0.03	-0.66	0.13	0.56	-0.13	-0.01	0.00
<i>Democratic Accountability</i>	0.35	-0.29	0.16	0.18	0.74	0.16	0.19	0.35	-0.02
<i>Bureaucracy Quality</i>	0.40	0.06	0.23	0.35	0.07	0.02	-0.70	-0.41	0.01
<i>Political Rights</i>	-0.35	0.45	0.35	0.16	0.18	0.03	0.04	-0.00	-0.71

<i>Civil Liberties</i>	-0.36	0.39	0.37	0.17	0.19	0.08	0.07	-0.01	0.71
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$$GOV1 = PC1*(0.46) + PC2*(0.18) + PC3*(0.10) + PC4*(0.09) + PC5*(0.05) + PC6*(0.05) + PC7*(0.03) + PC8*(0.03) + PC9*(0.01)$$

Table 3.9. GOV2 Indicator (ICRG)

<i>Component</i>	<i>Eigenvalue</i>	<i>Cumulative R²</i>						
PC1	3.41	0.49						
PC2	1.25	0.66						
PC3	0.81	0.78						
PC4	0.52	0.86						
PC5	0.41	0.92						
PC6	0.32	0.96						
PC7	0.27	1						
<i>Loadings</i>	PC1	PC2	PC3	PC4	PC5	PC6	PC7	
<i>Government Stability</i>	0.07	0.68	0.65	0.31	0.04	0.01	0.02	
<i>Internal Conflict</i>	0.43	0.20	-0.26	0.14	-0.71	-0.30	-0.32	
<i>Corruption</i>	0.44	-0.14	0.24	-0.31	0.45	-0.59	-0.28	
<i>Law and Order</i>	0.45	0.15	0.00	-0.47	-0.14	0.09	0.72	
<i>Ethnic Tensions</i>	0.32	0.38	-0.61	0.29	0.52	0.16	-0.01	
<i>Democratic Accountability</i>	0.33	-0.51	0.16	0.69	0.01	-0.09	0.35	
<i>Bureaucracy Quality</i>	0.45	-0.21	0.23	-0.12	-0.02	0.72	-0.41	

$$GOV2 = PC1*(0.49) + PC2*(0.17) + PC3*(0.12) + PC4*(0.08) + PC5*(0.06) + PC6*(0.04) + PC7*(0.04)$$

3.3.3. Estimates of Random Effects GLS Models

Random effects (RE) generalized least squares (GLS) estimation results prove that the extended gravity model works fine where the *AQ*, *PS* and *PA*, along with the *gov1* and *gov2* -extracted from the principal component analysis of all 9 and the relevant 7 governance indicators, respectively- turn out to be providing significant while mixed results in terms of their effects on bilateral trade shares. The below Table 3.12 provides that the governance indicators have significantly positive or negative effects with the model 4 having relatively more positive coefficients of 0.02 and 0.04 for the 9-indicator aggregated *gov1* and *gov3* variables imply that 1 point increase in the aggregated governance indicators lead around 2% and 4% increases in the bilateral trade

share of the home and partner country, respectively. Model 5 from Table 3.12 also provides partial success in favor of the partner country's aggregated governance indicators which imply a 1% increase in its trade share via 1 point increase in governance indicators. The rest of the results are somewhat mixed as it implies that grouping the governance indicators works fine especially when the success of bilateral trade is considered to be dependent on many forces at work together.

The first five models of Table 3.10 below however predict the trade shares by the use of geographical components alone. After inserting the dummies on income levels, regions, legal and colonial origins and the language fractionalization; the R^2 values and the coefficients on the central independent variables such as the Log (GDP), Log (Pop), Log (distance) or Log (area) do not vary much, as shown in Table 3.11. That is also the case for the FE estimation, besides the omitted variables of most of the dummies along with the area and distance measures since they do not vary over time.

Table 3.10. Random Effects GLS Estimation Results w/ Geography Variables

Model	(1)	(2)	(3)	(4)	(5)
Dependent Variable					
<i>Log (Trade Share)</i>					
<i>Log (GDP)_{exp}</i>	0.47 (47.93)**	0.41 (46.25)**	0.41 (46.31)**	0.41 (46.39)**	0.45 (41.49)**
<i>Log (GDP)_{imp}</i>	1.11 (120.08)**	1.07 (130.08)**	1.07 (129.73)**	1.05 (125.94)**	1.14 (113.24)**
<i>Log (POP)_{exp}</i>	-0.18 (-13.11)**	0.03 (2.19)**	0.04 (2.59)**	0.04 (2.54)**	0.00 (0.14)
<i>Log (POP)_{imp}</i>	-0.053 (-4.11)**	0.09 (6.21)**	0.09 (6.91)**	0.09 (6.88)**	0.04 (2.45)**
<i>Log (Area)_{exp}</i>		-0.15 (-14.69)**	-0.17 (-16.61)**	-0.17 (-16.72)**	-0.19 (-17.83)**
<i>Log (Area)_{imp}</i>		-0.12	-0.14	-0.13	-0.14

		(-11.85)**	(-13.81)**	(-13.14)**	(-13.92)**
<i>Log (Distance)</i>	-1.47	-1.30	-1.32	-1.32	
	(-74.33)**	(-54.65)**	(-55.47)**	(-50.67)**	
<i>Common language</i>		0.93	0.92	0.65	
		(19.77)**	(19.47)**	(13.36)**	
<i>Shared Border</i>		1.30	1.30	1.27	
		(12.02)**	(12.04)**	(11.42)**	
<i>FTA</i>		0.07	0.04	0.29	
		(1.46)	(0.87)	(5.89)**	
<i>Landlocked_{exp}</i>			0.01	-0.08	
			(0.27)	(-1.89)*	
<i>Landlocked_{imp}</i>			-0.46	-0.51	
			(-10.92)**	(-11.54)**	
<i>Climate (tropical)_{exp}</i>				0.22	
				(5.73)**	
<i>Climate (tropical)_{imp}</i>				0.41	
				(10.87)**	
<i>Language</i>					
<i>Fractionalization_{exp}</i>				0.69	
				(10.91)**	
<i>Language</i>				0.88	
<i>Fractionalization_{imp}</i>				(14.08)**	
<i>Constant</i>	-44.05	-31.33	-32.73	-32.17	-34.24
	(-162.89)	(-110.12)	(-108.98)	(-104.82)	(-103.79)
<i>Rho</i>	0.799	0.745	0.738	0.735	0.737
<i>(fraction of variance)</i>					
<i>R²</i>	0.33	0.49	0.50	0.50	0.51
<i>Number of Obs.</i>	201980	201980	201980	201980	188399
<i>Number of Groups</i>	17193	17193	17193	17193	15957

Note: (*) indicates significance at 10%, (**) indicates significance at 5% and (***) indicates significance at 1%.

The basic elements of the gravity equation seem working properly as the per capita GDP which is measured through GDP levels and population is positively associated with trade shares of any country. The country size which is proxied by surface area also yields intuitive results as it shows negative correlation with the trade

shares. This indicates that the domestic market size is negatively affecting countries' incentives for foreign trade. Dummy variables for border share, common language and the existence of an FTA agreement seem to work better for the partner country as expected. The positive relation of tropical climate to the increasing trade shares could best be described as a result of emerging market economies in the Southeast Asia during the mid-1990s as our dataset covers a range between 1995 and 2009.

Not surprisingly, the linguistic fractionalization in the partner country is positively correlated with increased trade shares, much more effective than the domestic fractionalization as seen in both Tables 3.10 and 3.11, also associated with the income level of the importing country.

Income level for the home country does not seem relevant in explaining the shares of exports to the GDP while it matters for the case of partner country both in Table 3.10 and 3.11. As the level of income decreases, the country tends to import more; presumably due to the lower world prices compared to the domestic market. The dummy variable for colonial origins do not make any change in the sign of coefficients while slightly changing the magnitudes, with all being negative for the home country, as observed in Table 3.11. Only for the partner country, being an ex-French colony makes a significant positive contribution along with being an ex-Spanish colony that negatively affects trade shares. An outcome regarding the countries' legal origin may come surprising initially is however a clear signal of ex-Soviet countries that showed a robust economic performance since the mid-1990s. Therefore, taking their Socialist legal origin as an indicator for trade does not seem to imply the expected results; due to the fact that these countries faced with sudden ups and downs to carry out a huge range of reforms both in markets and politics.

Table 3.11. Random Effects GLS Estimation Results w/ Dummy Variables

Model	(1)	(2)	(3)	(4)	(5)
Dependent Variable					
<i>Log (Trade Share)</i>					
<i>Log (GDP)_{exp}</i>	0.42 (26.61)**	0.44 (38.53)**	0.47 (39.15)**	0.39 (30.48)**	0.45 (40.85)**
<i>Log (GDP)_{imp}</i>	1.30 (85.70)**	1.16 (110.34)**	1.16 (103.25)**	1.16 (92.30)**	1.14 (114.63)**
<i>Log (POP)_{exp}</i>	0.01 (0.51)	0.02 (0.91)	-0.02 (-1.05)	-0.03 (-1.54)	-0.007 (-0.44)
<i>Log (POP)_{imp}</i>	-0.15 (-8.16)**	0.01 (0.75)	0.01 (0.40)	0.04 (2.37)*	0.04 (2.60)**
<i>Log (Area)_{exp}</i>	-0.19 (-15.88)**	-0.19 (-16.90)	-0.19 (-16.57)**	-0.14 (-12.52)**	-0.22 (-19.26)**
<i>Log (Area)_{imp}</i>	-0.18 (-16.41)**	-0.14 (-12.62)**	-0.14 (-13.23)**	-0.17 (-15.26)**	-0.14 (-13.95)**
<i>Log (Distance)</i>	-1.29 (-49.89)**	-1.28 (-47.10)**	-1.29 (-47.51)**	-1.48 (-52.54)**	-1.39 (-54.03)**
<i>Common language</i>	0.65 (13.35)**	0.67 (13.02)**	0.67 (12.99)**	0.66 (13.67)**	0.69 (14.26)**
<i>Shared Border</i>	1.33	1.33	1.25	1.03	1.14

	(12.13)**	(11.77)**	(10.89)**	(9.53)**	(10.47)**
FTA	0.35	0.27	0.35	0.25	0.22
	(7.01)**	(5.38)**	(6.74)**	(5.11)**	(4.53)**
Landlocked_{exp}	-0.10	-0.10	-0.20	-0.22	-0.29
	(-2.32)*	(-2.26)*	(-4.25)**	(-5.01)**	(-6.58)**
Landlocked_{imp}	-0.60	-0.49	-0.53	-0.55	-0.52
	(-13.49)**	(-10.84)**	(-11.11)**	(-12.52)**	(-11.97)**
Climate (tropical)_{exp}	0.18	0.32	0.46	0.27	0.32
	(4.61)**	(7.63)**	(10.96)**	(5.52)**	(7.88)**
Climate (tropical)_{imp}	0.32	0.48	0.46	0.18	0.42
	(8.21)**	(11.26)**	(10.81)**	(3.63)**	(11.25)**
Language					
Fractionalization_{exp}	0.63	0.60	0.69	0.77	0.61
	(9.51)**	(8.91)**	(10.35)**	(10.08)**	(9.55)**
Language	0.64	0.80	0.89	0.56	0.86
Fractionalization_{imp}	(9.67)**	(11.81)**	(13.34)**	(7.28)**	(13.89)**
Income Dummy_{exp}					
Low income	0.005				
	(0.06)				
Lower-middle income	0.04				
	(0.49)				
Upper-middle income	-0.08				
	(-1.07)				
High-income OECD	0.0009				

	(0.01)	
Income Dummy_{imp}		
<i>Low income</i>	1.55	
	(16.87)**	
<i>Lower-middle income</i>	0.92	
	(11.86)**	
<i>Upper-middle income</i>	0.43	
	(5.77)**	
<i>High-income OECD</i>	0.47	
	(6.49)**	
Colonial Dummy_{exp}		
<i>Ex-British colony</i>	-0.18	
	(-4.19)**	
<i>Ex-Spanish colony</i>	-0.34	
	(-5.83)**	
<i>Ex-French colony</i>	-0.19	
	(-3.12)**	
<i>Ex-Portuguese colony</i>	-0.19	
	(-1.99)*	
Colonial Dummy_{imp}		
<i>Ex-British colony</i>	-0.01	
	(-0.35)	
<i>Ex-Spanish colony</i>	-0.23	
	(-3.77)**	

<i>Ex-French colony</i>	0.33 (5.76)**
<i>Ex-Portuguese colony</i>	-0.18 (-1.80)*
Legal Origin Dummy_{exp}	
<i>British</i>	-0.24 (-2.61)**
<i>French</i>	-0.65 (-7.40)**
<i>Socialist</i>	0.26 (2.73)**
<i>German</i>	-0.39 (-3.31)**
<i>Scandinavian</i>	-----
Legal Origin Dummy_{imp}	
<i>British</i>	0.31 (3.42)**
<i>French</i>	0.27 (3.12)**
<i>Socialist</i>	0.56 (5.80)**
<i>German</i>	0.33 (2.81)**
<i>Scandinavian</i>	-----

Regional Dummy_{exp}	
<i>East Asia-Pacific</i>	0.93 (14.78)**
<i>Middle East and North Africa</i>	-0.48 (-7.48)**
<i>Eastern Europe-Central Asia</i>	0.39 (5.63)**
<i>Western Europe</i>	0.28 (3.77)**
<i>South Asia</i>	0.43 (3.96)**
<i>North America</i>	-0.39 (-2.83)*
<i>Sub-Sahara Africa</i>	-0.29 (-4.15)**
<i>Latin America and Caribbean</i>	-----

Regional Dummy_{imp}	
<i>East Asia-Pacific</i>	0.19 (2.97)**
<i>Middle East and North Africa</i>	-0.41 (-6.27)**
<i>Eastern Europe-Central Asia</i>	-0.19 (-2.67)**
<i>Western Europe</i>	-0.32

					(-4.31)**
<i>South Asia</i>					-0.26
					(-2.36)*
<i>North America</i>					0.27
					(1.86)*
<i>Sub-Sahara Africa</i>					0.36
					(5.11)**
<i>Latin America and Caribbean</i>					-----
Exporter-type Dummy_{exp}					
<i>Exporters of manufactures</i>					-0.10
					(-0.99)
<i>Exporters of non-fuel primary products</i>					-0.12
					(-1.14)
<i>Exporters of fuel (oil)</i>					-1.18
					(-11.09)**
<i>Exporters of services</i>					-1.21
					(-11.45)**
<i>Diversified Exporters</i>					-0.34
					(-3.36)**
<i>Constant</i>	-34.94	-34.66	-34.61	-31.54	-32.81
	(-104.19)	(-102.04)	(-96.52)	(-81.89)	(-96.90)
Rho	0.732	0.739	0.734	0.719	0.728
(fraction of variance)					
R²	0.513	0.515	0.523	0.530	0.524

Number of Obs.	188399	183642	176719	188399	188399
Number of Groups	15957	15499	14980	15957	15957

Note: (*) indicates significance at 10%, (**) indicates significance at 5% and (***) indicates significance at 1%.

A very persistent result from the regional dummy variables comes for the Middle Eastern and North African countries, which has always been significantly negative. This is in fact in line with the current numbers of intra-regional trade figures. When it comes to the type of exporters however, it seems that being an oil exporter or else other contributes negatively to the home country with only benefiting the partner countries, not shown in the above table.

Table 3.12. Random Effects GLS Estimation Results w/ Governance Indicators

Model	(1)	(2)	(3)	(4)	(5)
Dependent Variable					
<i>Log (Trade Share)</i>					
<i>Log (GDP)_{exp}</i>	0.40 (44.44)**	0.40 (44.32)**	0.34 (35.15)**	0.40 (43.05)**	0.40 (44.24)**
<i>Log (GDP)_{imp}</i>	1.05 (122.70)**	1.04 (121.94)**	1.01 (111.10)**	1.04 (119.53)**	1.05 (121.40)**
<i>Log (POP)_{exp}</i>	0.05 (3.50)**	0.05 (3.69)**	0.09 (5.88)**	0.06 (3.84)**	0.05 (3.52)**
<i>Log (POP)_{imp}</i>	0.10 (7.08)**	0.10 (7.47)**	0.13 (8.99)**	0.11 (8.18)**	0.10 (7.28)**
<i>Log (Area)_{exp}</i>	-0.18 (-17.33)**	-0.18 (-17.31)**	-0.15 (-13.99)**	-0.16 (-15.05)**	-0.18 (-17.19)**
<i>Log (Area)_{imp}</i>	-0.13 (-13.12)**	-0.13 (-13.00)**	-0.12 (-11.27)**	-0.13 (-12.41)**	-0.13 (-12.87)**
<i>Log (Distance)</i>	-1.31 (-54.78)**	-1.32 (-55.42)**	-1.38 (-56.65)**	-1.34 (-55.19)**	-1.31 (-54.95)**
<i>Common language</i>	0.90 (19.21)**	0.91 (19.47)**	0.90 (18.89)**	0.91 (19.15)**	0.91 (19.30)**
<i>Shared Border</i>	1.28 (11.88)**	1.29 (12.04)**	1.22 (11.29)**	1.25 (11.60)**	1.29 (11.94)**
<i>FTA</i>	0.07	0.06	-0.02	0.04	0.07

	(1.56)	(1.38)	(-0.41)	(0.94)	(1.48)
<i>Landlocked_{exp}</i>	0.03 (0.80)	0.03 (0.64)	-0.03 (-0.72)	0.03 (0.27)	0.03 (0.67)
<i>Landlocked_{imp}</i>	-0.47 (-11.08)**	-0.48 (-11.39)**	-0.53 (-12.41)**	-0.48 (-11.18)**	-0.48 (-11.30)**
<i>AQ_{exp}</i>		-0.0006 (-0.13)			
<i>PS_{exp}</i>	-0.04 (-7.68)**				
<i>PA_{exp}</i>			-0.14 (-16.44)**		
<i>GOV1_{exp}</i>				0.02 (3.21)**	
<i>GOV2_{exp}</i>					-0.01 (-1.90)*
<i>AQ_{imp}</i>		0.02 (4.10)**			
<i>PS_{imp}</i>	-0.02 (-2.97)**				
<i>PA_{imp}</i>			-0.12 (-14.54)**		
<i>GOV1_{imp}</i>				0.04 (7.58)**	
<i>GOV2_{imp}</i>					0.01 (2.91)**
<i>Constant</i>	-32.21 (-103.77)	-32.17 (-104.47)	-30.59 (-95.55)	-32.25 (-103.46)	-32.17 (-103.92)
Rho (fraction of variance)	0.740	0.735	0.737	0.736	0.739
R²	0.51	0.51	0.51	0.505	0.507
Number of Obs.	190640	190640	185203	185203	190640
Number of Groups	17103	17103	16733	16733	17103

Note: (*) indicates significance at 10%, (**) indicates significance at 5% and (***) indicates significance at 1%.

The random effects (RE) GLS model well fits into the theory of international trade as well as the governance literature. It also provides intuitive results regarding the effects of governance indicators on bilateral trade. Not shown in the above table however, the fixed effect (FE) and between estimator (BE) models however lead to omitted variables due to the multi-collinearity issues. Tests for multi-collinearity and heteroscedasticity are therefore essential for the latter panel settings while it could easily be stated that the log-log functional form under the RE setting is by far the most explanatory one.

For further analysis, lagged variables of *trade*, *population* and *gdp*; along with the logarithmic values of those variables are also created for our log-linear model specification since the dataset contains adequate number of years. The auto-regressive process is essential to comprehend due to the structure of our dataset. For that reason we apply a simple test on the potential serial correlation issues in the error terms of our panel dataset. Using the STATA's "xtserial" command, we implement a test for serial correlation in the idiosyncratic errors of a linear panel-data model, as discussed by Wooldridge (2002). Under the null of no serial the residuals from the regression of the first-differenced variables should have an auto-correlation of -.5. This implies that the coefficient on the lagged residuals in a regression of the lagged residuals on the current residuals should be -.5. STATA's "xtserial" performs a Wald test of this hypothesis. Below is the brief statistics on the test results for our main independent variables of *log(gdp)*; and *log(pop)* for both reporting and the partner country:

Table 3.13. Wooldridge Test for Auto-correlation in the Panel

<i>Linear regression</i>					
F(4, 16024) = 431.89					
Prob > F = 0.0000					
R-squared = 0.0074					
Root MSE = 1.188					
(Std. Err. adjusted for 16025 clusters in pair_id) Robust					
Trade share	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]

Log(reporter's GDP)	0.34	0.09	3.91	0.000	0.17	0.51
Log(partner's GDP)	1.62	0.07	23.21	0.000	1.48	1.75
Log(reporter's pop)	-0.17	0.17	-0.99	0.32	-0.51	0.17
Log(partner's pop)	-0.31	0.16	-2.01	0.05	-0.61	-0.007

H0: no first order autocorrelation

F(1, 15207) = 1311.041

Prob > F = 0.0000

Number of observations 177391

It is quite evident now that the dataset is not flawed with potential AR(1) issues so that we have the opportunity to run the AR process equations with the lagged value of *trade share* on the right-hand-side. Therefore we may see the linear AR(1) process at work and all the five equations suggest that the lagged value of bilateral trade captures most of the explanation in defining the bilateral trade shares for a given pair of countries; this is however is a manipulating result. A two-step estimation with AR(1) disturbances (Durbin-Watson) is utilized under the random-effects GLS technique in order to reveal the lagged value of bilateral trade share effects on explaining the dependent variable itself. With the AR(1) process including the lagged value of the dependent variable, we observe most of the coefficients get the expected signs in line with theory and literature. The effect of the lagged value of *log (trade share)* is significant whereas the data provides some consistent results: regional dummy MENA has always significantly negative impact on trade shares; being a former Spanish colony is always bad for creating more trade. for the distinction between the home and partner country: the latter seems to matter more in terms of basic gravity variables such as *log (GDP)*, *log (pop)*; and *log (distance)*. Being a diversified exporter and exporter of manufactures is a positive factor at increasing the trade share while services exporters tend to perform poorly. Oil exporting country dummy on the other hand provide mixed results while in most of the equations it has a negative coefficient sign. For the governance indicators, the RE GLS models with auto-regressive disturbances seem to yield more robust results in favor of the *AQ*, *PS*, *GOV1* and *GOV2*.

The procedure however yields most of the time-dependent series to disappear and get omitted from the equation, due to the multicollinearity issue. The lagged value of export share therefore is over-estimated to cause most of the variation in bilateral trade shares

across the countries. The analysis however becomes flawed although the simple autocorrelation test above suggested that the panels are not subject to serial correlation in their error terms. The panel data set however includes several time dependent and dummy variables which lose their signs or become insignificant in the AR(1) process estimations. Therefore these results are excluded from this section of the dissertation.

3.3.4. Further Results and Interpretations

The Random Effects GLS estimation is proven to work fine with our dataset as the fixed effect estimator is not favored over the random effects, stated by the Hausman test. Meantime, the fixed effect estimation does not improve the R^2 or the F-test values among the panel estimations. The coefficients on the random effects GLS estimation might seem to be quite a bit of surprising while the FE estimation does not make any significant change in results, except providing the administrative quality for both the home and partner country become positive and significant in estimating trade share.

Overall however, we should note that the institutional elements work better in the case of partner countries. This might be due to the developing and developed countries distinction. The developing countries emerging as big net exporters in the world economy usually do not have good institutional quality, especially on the public accountability frontier. Therefore, the geographical instruments and partly the colonial past reveal much of the trade share differences among countries. The global values of governance indicators as aggregated in *GOV* variables (four distinct variables for the exporting and importing country) prove to be more consistent with the literature while the sub-groups such as *AQ*, *PS* and *PA* do not seem to be playing a significant role by alone. That might lead us to the interpretation that governance is not a single space and one-dimensional phenomenon. When put together into the trade share estimation gravity equations, institutional variables tend to work better when aggregated at the highest level. For the purpose of this dissertation however, we are content only with the RE estimation results in this section.

Provided the linear static estimations of the data, we are aware that unit root tests and dynamic panel estimations using Arellano-Bond and Arellano-Bover/Blundell-Bond

techniques should also be considered since the longitudinal/panel structure of our model requires more than a static analysis. An extension towards understanding the dynamics of the individual effects of governance indicators on trade shares is provided in the Appendix; along with the depiction of factor analysis.

4. CONCLUSION

The above literature and our empirical findings aim at building the missing blocks between the interplay between institutions and openness –measured by total bilateral commodity trade share- where the direction of the relationship is defined from governance indicators to bilateral trade. Meta-institutions such as democracy, rule of law and superiority of property rights along with the practical governance measures could therefore be employed as parts of an extended gravity model of international trade. Our gravity model with institutional components is therefore proven to provide some intuition on the effects of governance variables and institutional basis on bilateral trade at a multi-country panel setting.

This dissertation is an attempt to provide empirical and intuitional reasoning for the comparative roles of institutions –proxied by governance indicators- and geographical measures that instrument the trade patterns in some way. The interplay and counter play of the two broad categories of phenomenon however differ in their structural formation. While institutions are built-up structures by mankind, geography is usually assumed to be given. Despite Krugman's (1999) effective article that asserts the geography could also be constructed, geographical variables are often regarded as hard to change. Institutions on the other hand do evolve in time; though the governance indicators that they manifest themselves are subject to faster change (see Roland, 2004 and Aysan, 2007a).

Our results imply that governance phenomena should be considered altogether or as a whole when assessing its impact on trade. On the contrary, as we run several other regressions with individual governance indicators such as *corruption* or *government stability*

alone; they prove to be much more significantly effective with their signs being mixed (see, Appendix). The sub-categories, other than the *GOV1* or *GOV3* variables that stand for the home and partner countries' aggregated governance variables, however yield relatively better results in explaining the trade dynamics. The explanatory power of the historical and cultural effects (i.e. *legal* and *colonial origin*) is also limited due to the dominance of geographical variables, including many dummies employed in several regressions (see, Table 3.11).

Our results indicate that first geography elements and governance indicators are not substitutes to each other and at most complementary. Second, governance indicators dominate historical and cultural roots in many cases as seen in the above Table 3.12. Geographical components however do not vary much in explaining trade dynamics among countries. The effort made in this dissertation therefore gains its utmost importance since it attempts to fill the gap that neither geographical nor historical and other fixed variables could explain in trade dynamics. We claim that governance indicators are crucial and at least equally important to understand how relative trade shares or levels evolve overtime. They are at their best reflectors of the overall institutional basis and quality that a society lives along with. Given that point, it is expectedly to assume that they are indeed effective in explaining trade policies or other policy choices which in turn result in different levels of trade, growth and development.

Further research should focus on explaining the cross-border or gravity puzzle as indicated by Trefler (1995) and Anderson and van Wincoop (2003) with the governance indicators while trying to identify which one of the geographical and governance components of bilateral trade being more effective. Country specific effects in explaining the differences in bilateral trade volumes/shares might well stem from the governance indicators mostly or vice versa (Sachs, 2003). Yet another aim of further research should include the estimation of growth rate differences among countries with an extended gravity approach as used by Frankel and Romer (1999). By doing so, the constructed variable for bilateral trade volumes or trade shares might work fine when includes the relevant governance indicators. The trade inductive and inhibitive factors might work differently when further studies are carried out with industry-level data. The size effect of the within

and between country-trade shares will only then become meaningful to solve the border puzzle as well as the dynamics of increases/reductions in bilateral trade. Another attempt should include understanding the interplay among governance indicators and searching for the possible signs of causality between them. A seemingly unrelated equation technique along with simultaneous equations approach might prove more insightful results that would open door for further inquiry in the field.

APPENDIX

A1. List of Countries Subject to the Data Analysis

Albania	Guinea	Oman
Algeria	Guinea-Bissau	Pakistan
Angola	Guyana	Panama
Argentina	Haiti	Papua New Guinea
Armenia	Honduras	Paraguay
Australia	Hong Kong	Peru
Austria	Hungary	Philippines
Azerbaijan	Iceland	Poland
Bahamas	India	Portugal
Bahrain	Indonesia	Qatar
Bangladesh	Iran	Romania
Belarus	Iraq	Russia
Belgium	Ireland	Saudi Arabia
Bolivia	Israel	Senegal
Botswana	Italy	Serbia & Montenegro
Brazil	Jamaica	Sierra Leone
Brunei	Japan	Singapore
Bulgaria	Jordan	Slovakia
Burkina Faso	Kazakhstan	Slovenia
Cameroon	Kenya	Somalia
Canada	Korea, DPR	South Africa
Chile	Kuwait	South Korea
China	Latvia	Spain
Colombia	Lebanon	Sri Lanka
Congo	Liberia	Sudan
Congo, DR	Libya	Suriname
Costa Rica	Lithuania	Sweden
Cote d'Ivoire	Luxembourg	Switzerland
Croatia	Madagascar	Syria
Cuba	Malawi	Taiwan
Cyprus	Malaysia	Tanzania
Czech Republic	Mali	Thailand
Denmark	Malta	Togo
Dominican Republic	Mexico	Trinidad & Tobago
Ecuador	Moldova	Tunisia
Egypt	Mongolia	Turkey
El Salvador	Morocco	UAE
Estonia	Mozambique	Uganda
Ethiopia	Myanmar	Ukraine
Finland	Namibia	United Kingdom

France	Netherlands	United States
Gabon	New Caledonia	Uruguay
Gambia	New Zealand	Venezuela
Germany	Nicaragua	Vietnam
Ghana	Niger	Yemen
Greece	Nigeria	Zambia
Guatemala	Norway	Zimbabwe

A2. Notes on Factor Analysis and Principal Component Analysis (PCA)

Principal component analysis (PCA) is a statistical technique used for data reduction. The leading eigenvectors from the “Eigen” decomposition of the correlation or covariance matrix of the variables describe a series of uncorrelated linear combinations of the variables that contain most of the variance. In addition to data reduction, the eigenvectors from a PCA are often inspected to learn more about the underlying structure of the data. *“The STATA commands “pca” and “pcamat” display the eigenvalues and eigenvectors from the PCA eigen decomposition. The eigenvectors are returned in orthonormal form, i.e., orthogonal (uncorrelated) and normalized (with unit length, $L'L = I$). The command “pcamat” provides the correlation or covariance matrix directly. For “pca” the correlation or covariance matrix is computed from the variables in “varlist”.*

“pcamat” allows the correlation or covariance matrix to be specified as a $k \times k$ symmetric matrix with row and column names set to the variable names or as a $k(k+1)/2$ long row or column vector containing the lower or upper triangle C along with the “names()” option providing the variable names. See the “shape()” option for details. The “vce(normal)” option of “pca” and “pcamat” provides standard errors of the eigenvalues and eigenvectors and aids in interpreting the eigenvectors. The commands “pca” and “pcamat” with the “vce(normal)” option assume that

(A1) the variables are multivariate normal distributed and

(A2) the variance-covariance matrix of the observations has all distinct and strictly positive eigenvalues.

Under assumptions A1 and A2, the eigenvalues and eigenvectors of the sample covariance matrix can be seen as maximum likelihood estimates for the population analogues and they are asymptotically (multivariate) normal distributed. Be cautious in interpreting because the asymptotic variances are rather sensitive to violations of assumption A1 (and A2). Wald tests of hypotheses that are in conflict with assumption A2 (e.g., testing that the first and second eigenvalue are the same) produce incorrect p-values.

Because the statistical theory for a PCA of a correlation matrix is much more complicated, “pca” and “pcamat” compute standard errors and tests of a correlation matrix as if it were a covariance matrix. This will usually lead to some underestimation of standard errors, but we believe that this problem is smaller than the consequences of deviations from normality.” (Stata 11 Help Manual)

“Principal Components Analysis is a method that reduces data dimensionality by performing a covariance analysis between factors. As such, it is suitable for data sets in multiple dimensions, such as a large experiment in gene expression. PCA is a useful statistical technique that has found application in fields such as face recognition and image compression, and is a common technique for finding patterns in data of high dimension.

It is a way of identifying patterns in data, and expressing the data in such a way as to highlight their similarities and differences. Since patterns in data can be hard to find in data of high dimension, where the luxury of graphical representation is not available, PCA is a powerful tool for analyzing data.

The other main advantage of PCA is that once you have found these patterns in the data, and you compress the data, i.e. by reducing the number of dimensions, without much loss of information. Here is where the notion of data compression and reduced dimensionality comes into it. If you look at the eigenvectors and eigenvalues from the previous section, you will notice that the eigenvalues are quite different values. In fact, it turns out that the eigenvector with the highest eigenvalue is the principle component of the data set. In our example, the eigenvector with the largest eigenvalue was the one that pointed down the middle of the data. It is the most significant relationship between the data dimensions.

In general, once eigenvectors are found from the covariance matrix, the next step is to order them by eigenvalue, highest to lowest. This gives you the components in order of significance. Now, if you like, you can decide to ignore the components of lesser significance. You do lose some information, but if the eigenvalues are small, you don't lose much. If you leave out some components, the final data set will have fewer dimensions than the original. To be precise, if you originally have p dimensions in your data, and so you calculate p eigenvectors and eigenvalues, and then you choose only the first k eigenvectors, then the final data set has only k dimensions. What needs to be done now is you need to form a feature vector, which is just a fancy name for a matrix of vectors. This is constructed by taking the eigenvectors that you want to keep from the list of eigenvectors, and forming a matrix with these eigenvectors in the columns.” (Smith, 2002)

The scree plot option his graphs the eigenvalue on the y-axis and the component number on the x-axis. You look for the ‘elbow’ in the chart and the component before the elbow is the ‘optimal’ solution. Stata will make this plot for you automatically with the command “greigen”. The advice of the scree plot would be to pick 1 component when the elbow occurs at component 2 and it goes like this. This would suggest that one component accounts for a disproportionately large amount of the combined variance.

Another widely used method for deciding how many components to keep is to just keep every component with an eigenvalue over 1. The reasoning here is that each individual variable accounts for a variance of 1. If a component accounts for a variance of more than 1, then it accounts for more variance than any one of the original observed variables could.

The one constant in scaling solutions of any favor is that they do not interpret themselves. Principal components are no exception. You have to impose some meaning on the components so you can substantively interpret the effects they have in a predictive model. We can use the information in the “Principal Components (eigenvectors)” table for this task. These are the coefficients relating the observed variables to the coefficients and can be interpreted like linear model coefficients. We can call these coefficients\component loadings”. If one variable has a high component loading, that means as that variable gets bigger, the Component gets bigger.

*Stata is getting the correlation matrix of the data, so it is not essential that the variables are standardized as this will happen in the computation of the correlation matrix. Then, Stata performs singular value decomposition on the correlation matrix. It would also be possible to perform a singular value decomposition on the n*k data matrix. The results are not identical, but are substantively similar. It is unlikely that one would provide a different understanding of what is going on in the data, even though the numbers may not be exactly the same. Eigen decomposition is a special case of singular value decomposition performed on a square, symmetric matrix (like a correlation matrix).” (Armstrong, 2009)*

Table A2.1. KMO and Bartlett's Test for Factor Analysis- ICRG Indicators

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.			,872
Bartlett's Test of Sphericity	Approx. Chi-Square	1741500,49	
			1
	df		66
	Sig.		,000

Table A2.2. Total Variance Explained (Factor Analysis)- ICRG Indicators

Component	Extraction Sums of Squared								
	Initial Eigenvalues			Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5,482	45,686	45,686	5,482	45,686	45,686	4,206	35,051	35,051
2	1,273	10,605	56,291	1,273	10,605	56,291	2,320	19,330	54,381
3	1,033	8,608	64,899	1,033	8,608	64,899	1,262	10,518	64,899
4	,854	7,115	72,014						
5	,841	7,008	79,021						
6	,601	5,005	84,026						

7	,517	4,308	88,334
8	,393	3,271	91,606
9	,322	2,681	94,287
10	,254	2,118	96,404
11	,242	2,019	98,423
12	,189	1,577	100,000

Extraction Method: Principal Component Analysis.

Table A2.3. Rotated Component Matrix of ICRG Indicators^a

Factor	Component		
	1	2	3
Bureaucratic Quality	,849	,217	-,061
Socioeconomic Conditions	,797	,233	,226
Investment	,752	,046	,253
Role of Military in Politics	,737	,441	-,031
Democratic Accountability	,709	,087	-,446
Corruption	,683	,366	-,069
Law and Order	,611	,474	,232
Ethnic Fractionalization	,155	,742	,263
Internal Conflict	,487	,664	,174
Religious Tensions	,049	,641	-,185
External Conflicts	,356	,502	-,093
Government Stability	,083	,020	,861

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

Table A2.4. Principal Components and Loadings (PCA Analysis) for ICRG Indicators

Component	Eigenvalue	Cumulative R²
Comp1	5.49804	0.46
Comp2	1.27168	0.56
Comp3	1.0304	0.65
Comp4	.854445	0.72
Comp5	.835654	0.79
Comp6	.597315	0.84
Comp7	.518236	0.88
Comp8	.387173	0.91
Comp9	.322644	0.94
Comp10	.253139	0.96
Comp11	.242891	0.98
Comp12	.188385	1

Figure A2.1. Scree plot of the Factor Components of ICRG Governance Indicators

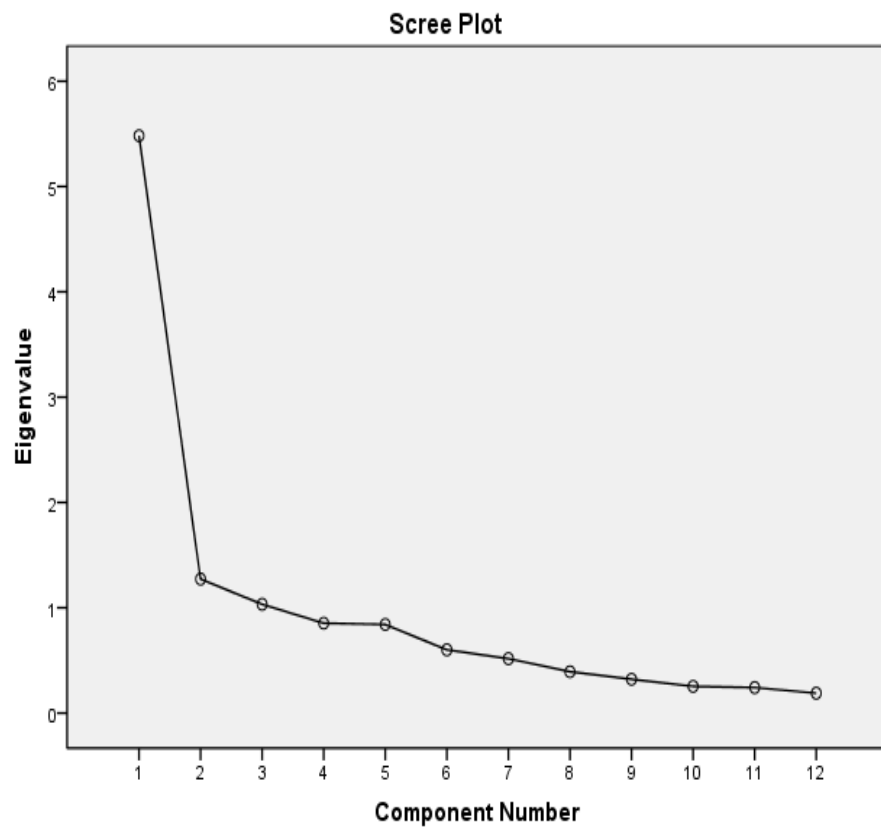


Figure A2.2. Principal Components of ICRG Indicators in a 3-D Rotated Space

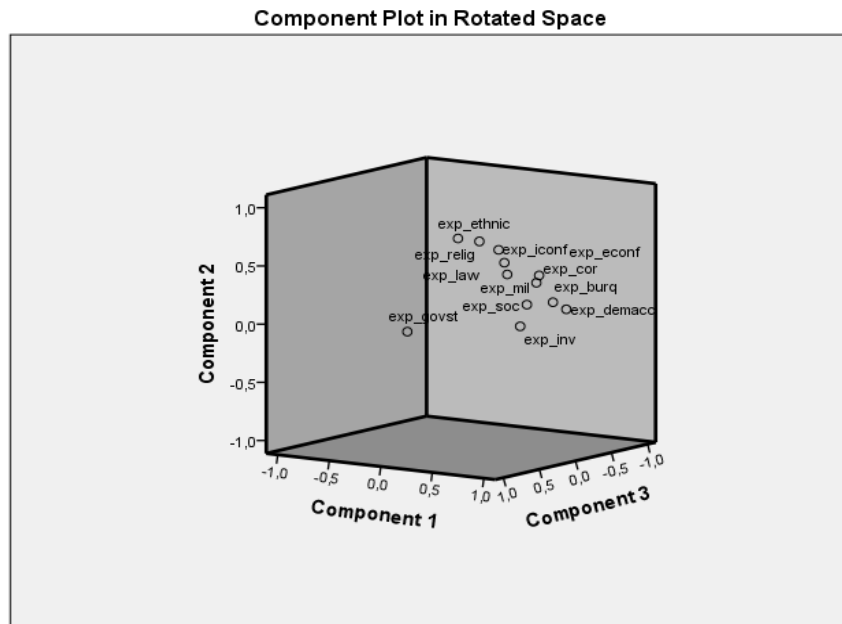
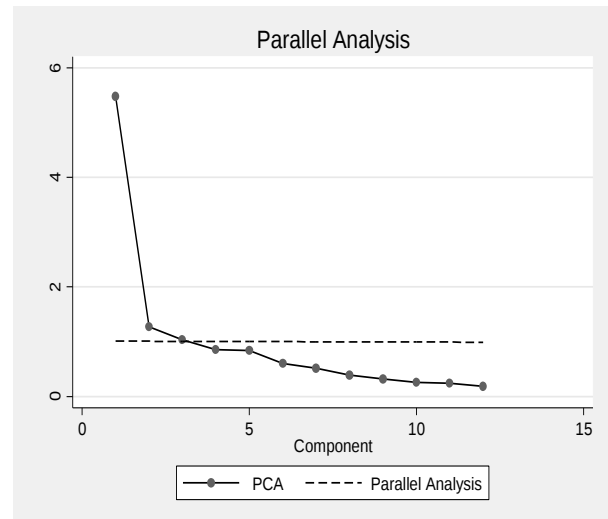
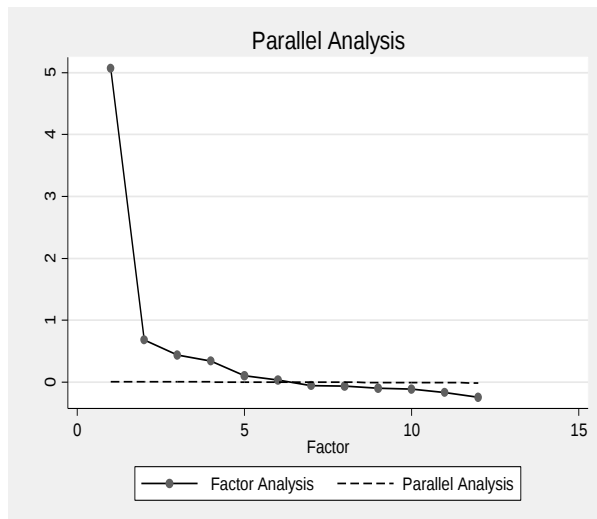


Figure A2.3. Fitting Factor Analysis and the PCA with Parallel Analysis-ICRG Indicators



A3. Robustness Checks

This section provides a gradual understanding of the role of governance indicators in determining bilateral trade in terms of exports' ratio to the GDP. Several regressions are run in order to achieve a comprehensive picture of different governance indicators effective on different mechanisms. Below tables from A3.1 through A3.9 depict the mixed and sometimes controversial results of individual indicators that have either positive or negative effects on trade share. The definitions for the variables are listed below:

ltshare: Log (Trade Share)

lgdp: Log (GDP) for both home and partner countries (i.e. *_exp* and *_imp* refer to the exporter and importer country)

lpop: Log (Population) for both countries engaging in bilateral trade

larea: Log (Area) for both countries

ldist: Log of Great Circle Distance between the home and partner countries

landlocked: Dummy Variable for Being Landlocked

comlang: Dummy Variable for Common Language

border: Dummy Variable for Shared Border

fta: Dummy Variable for an FTA agreement between the countries

exp_govst and *imp_govst*: Government Stability Indicator for both countries (ICRG)

exp_iconf and *imp_iconf*: Internal Conflict Indicator for both countries (ICRG)

exp_ethnic and *imp_ethnic*: Ethnic Tensions Indicator for both countries (ICRG)

exp_cor and *imp_cor*: Corruption Indicator for both countries (ICRG)

exp_law and imp_law: Law and Order Indicator for both countries (ICRG)

exp_burq and imp_burq: Bureaucratic Quality Indicator for both countries (ICRG)

exp_demacc and imp_demacc: Democratic Accountability Indicator for both countries (ICRG)

exp_pr and imp_pr: Political Rights Indicator for both countries (Freedom House)

exp_cl and imp_cl: Civil Liberties Indicator for both countries (Freedom House)

Table A3.1. Random Effects GLS Estimation Results- I

Random-effects GLS regression	Number of obs	=	190640
Group variable: pair_id	Number of groups	=	17103
R-sq: within = 0.0857	Obs per group: min	=	1
between = 0.5633	avg	=	11.1
overall = 0.5065	max	=	15
Wald chi2(14)	=	37115.37	
corr(u_i, X) = 0 (assumed)	Prob > chi2	=	0.0000
lshare	Coef.	Std. Err.	z P> z [95% Conf. Interval]
lgdp_exp	.404878	.0090857	44.56 0.000 .3870705 .4226856
lgdp_imp	1.05483	.008543	123.47 0.000 1.038086 1.071574
lpop_exp	.0573973	.0149952	3.83 0.000 .0280072 .0867874
lpop_imp	.1018299	.0137865	7.39 0.000 .0748088 .1288511
larea_exp	-.1816541	.0103855	-17.49 0.000 -.2020093 -.1612988
larea_imp	-.1335471	.0099499	-13.42 0.000 -.1530486 -.1140456
ldist	-1.319668	.0240045	-54.98 0.000 -1.366716 -1.27262
landlocke~xp	.0270214	.0426385	0.63 0.526 -.0565486 .1105914

landlocke~mp	-.4707329	.0426712	-11.03	0.000	-.5543669	-.3870989
comlang	.9098866	.0470536	19.34	0.000	.8176633	1.00211
border	1.274538	.1080915	11.79	0.000	1.062683	1.486394
fta	.0587939	.0469589	1.25	0.211	-.0332439	.1508316
exp_govst	-.028469	.0020675	-13.77	0.000	-.0325214	-.0244167
imp_govst	-.0134429	.0020448	-6.57	0.000	-.0174506	-.0094352
_cons	-31.9635	.3107909	-102.85	0.000	-32.57264	-31.35437

Table A3.2. Random Effects GLS Estimation Results- II

Random-effects GLS regression	Number of obs	=	190640
Group variable: pair_id	Number of groups	=	17103
R-sq: within = 0.0862	Obs per group: min =		1
between = 0.5640	avg =		11.1
overall = 0.5072	max =		15
Wald chi2(16)	=		37465.57
corr(u_i, X) = 0 (assumed)	Prob > chi2	=	0.0000

ltshare	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
lgdp_exp	.400938	.009066	44.22	0.000	.3831691 .418707
lgdp_imp	1.050088	.0085426	122.92	0.000	1.033344 1.066831
lpop_exp	.0624385	.0149211	4.18	0.000	.0331937 .0916833
lpop_imp	.1074352	.0137231	7.83	0.000	.0805385 .1343319
larea_exp	-.1806061	.0103271	-17.49	0.000	-.2008469 -.1603653
larea_imp	-.1323437	.0098957	-13.37	0.000	-.1517389 -.1129486
ldist	-1.321971	.0238572	-55.41	0.000	-1.36873 -1.275211
landlocke~xp	.0169098	.042416	0.40	0.690	-.066224 .1000435
landlocke~mp	-.4814987	.04245	-11.34	0.000	-.5646991 -.3982983

comlang	.9113986	.0467613	19.49	0.000	.8197481	1.003049
border	1.27453	.1074096	11.87	0.000	1.064011	1.485049
fta	.0497131	.0466849	1.06	0.287	-.0417875	.1412137
exp_govst	-.0270915	.002092	-12.95	0.000	-.0311916	-.0229913
imp_govst	-.012301	.0020729	-5.93	0.000	-.0163638	-.0082382
exp_iconf	.0123386	.0019528	6.32	0.000	.0085113	.016166
imp_iconf	.0128566	.0019391	6.63	0.000	.0090559	.0166572
_cons	-32.19317	.3104625	-103.69	0.000	-32.80167	-31.58468

Table A3.3. Random Effects GLS Estimation Results- III

Random-effects GLS regression	Number of obs	=	190640
Group variable: pair_id	Number of groups	=	17103
R-sq: within = 0.0867	Obs per group: min =		1
between = 0.5634	avg =		11.1
overall = 0.5067	max =		15
Wald chi2(18)	=	37845.82	
corr(u_i, X) = 0 (assumed)	Prob > chi2	=	0.0000
lshare	Coef.	Std. Err.	z P> z [95% Conf. Interval]
lgdp_exp	.3997269	.0090187	44.32 0.000 .3820507 .4174032
lgdp_imp	1.048775	.008496	123.44 0.000 1.032124 1.065427
lpop_exp	.0634025	.0148005	4.28 0.000 .0343941 .092411
lpop_imp	.1081602	.0136112	7.95 0.000 .0814827 .1348376
larea_exp	-.1799833	.0102452	-17.57 0.000 -.2000635 -.1599031
larea_imp	-.1315824	.0098174	-13.40 0.000 -.1508242 -.1123407
ldist	-1.322612	.0236497	-55.93 0.000 -1.368964 -1.276259
landlocke~xp	.014064	.042068	0.33 0.738 -.0683878 .0965158

landlocke~mp	-.4842936	.042097	-11.50	0.000	-.5668023	-.4017849
comlang	.9133788	.0463568	19.70	0.000	.8225211	1.004237
border	1.272766	.1064518	11.96	0.000	1.064124	1.481408
fta	.0496415	.0462853	1.07	0.283	-.041076	.1403589
exp_govst	-.0274618	.0021032	-13.06	0.000	-.031584	-.0233396
imp_govst	-.0125369	.0020826	-6.02	0.000	-.0166187	-.0084551
exp_iconf	.0092456	.0022164	4.17	0.000	.0049016	.0135896
imp_iconf	.0101483	.0021808	4.65	0.000	.0058739	.0144226
exp_ethnic	.0106617	.0037219	2.86	0.004	.0033669	.0179564
imp_ethnic	.009731	.0037247	2.61	0.009	.0024307	.0170312
_cons	-32.1944	.3085341	-104.35	0.000	-32.79912	-31.58969

Table A3.4. Random Effects GLS Estimation Results- IV

Random-effects GLS regression	Number of obs	=	190640
Group variable: pair_id	Number of groups	=	17103
R-sq: within = 0.0869	Obs per group: min =		1
between = 0.5635	avg =		11.1
overall = 0.5068	max =		15
Wald chi2(20)	=	37965.47	
corr(u_i, X) = 0 (assumed)	Prob > chi2	=	0.0000
ltshare	Coef.	Std. Err.	z P> z [95% Conf. Interval]
lgdp_exp	.4006542	.0090441	44.30 0.000 .3829282 .4183802
lgdp_imp	1.048126	.0085238	122.96 0.000 1.03142 1.064832
lpop_exp	.0635531	.0147716	4.30 0.000 .0346013 .092505
lpop_imp	.1090542	.0135847	8.03 0.000 .0824287 .1356796
larea_exp	-.1804377	.0102243	-17.65 0.000 -.200477 -.1603984

larea_imp	-1.1316829	.0097995	-13.44	0.000	-.1508896	-.1124761
ldist	-1.323121	.0235922	-56.08	0.000	-1.369361	-1.276881
landlocke~xp	.0153141	.0419676	0.36	0.715	-.066941	.0975691
landlocke~mp	-.4837297	.0420001	-11.52	0.000	-.5660484	-.401411
comlang	.9134866	.0462293	19.76	0.000	.8228788	1.004094
border	1.273026	.1061485	11.99	0.000	1.064978	1.481073
fta	.0471536	.0462479	1.02	0.308	-.0434907	.1377979
exp_govst	-.0272714	.0021098	-12.93	0.000	-.0314065	-.0231362
imp_govst	-.0126695	.0020881	-6.07	0.000	-.0167621	-.0085769
exp_iconf	.0092918	.0022688	4.10	0.000	.0048451	.0137385
imp_iconf	.0094022	.0022293	4.22	0.000	.0050329	.0137715
exp_ethnic	.0102234	.0037778	2.71	0.007	.0028192	.0176277
imp_ethnic	.0085679	.0037853	2.26	0.024	.0011488	.0159869
exp_cor	-.0002019	.0035169	-0.06	0.954	-.0070948	.006691
imp_cor	.0059371	.0035417	1.68	0.094	-.0010044	.0128787
_cons	-32.21073	.3094192	-104.10	0.000	-32.81718	-31.60428

Table A3.5. Random Effects GLS Estimation Results- V

Random-effects GLS regression	Number of obs	=	190640
Group variable: pair_id	Number of groups	=	17103
R-sq: within = 0.0869	Obs per group: min =		1
between = 0.5632	avg =		11.1
overall = 0.5065	max =		15
Wald chi2(22)	=	38044.89	
corr(u_i, X) = 0 (assumed)	Prob > chi2	=	0.0000
ltshare	Coef.	Std. Err.	z P> z [95% Conf. Interval]

lgdp_exp	.4023494	.009056	44.43	0.000	.3845999	.4200989
lgdp_imp	1.046236	.0085364	122.56	0.000	1.029505	1.062967
lpop_exp	.0619215	.0147582	4.20	0.000	.0329959	.0908471
lpop_imp	.1088791	.013568	8.02	0.000	.0822862	.135472
larea_exp	-.1807644	.010211	-17.70	0.000	-.2007775	-.1607513
larea_imp	-.130784	.0097886	-13.36	0.000	-.1499693	-.1115986
ldist	-1.324302	.0235625	-56.20	0.000	-1.370484	-1.278121
landlocke~xp	.0173662	.0419111	0.41	0.679	-.064778	.0995105
landlocke~mp	-.4860394	.0419522	-11.59	0.000	-.5682641	-.4038147
comlang	.912067	.0461597	19.76	0.000	.8215957	1.002538
border	1.270081	.1059895	11.98	0.000	1.062346	1.477817
fta	.049456	.0461826	1.07	0.284	-.0410602	.1399721
exp_govst	-.0270684	.0021107	-12.82	0.000	-.0312053	-.0229315
imp_govst	-.0126869	.0020886	-6.07	0.000	-.0167804	-.0085933
exp_iconf	.0119122	.002374	5.02	0.000	.0072592	.0165651
imp_iconf	.009113	.0023355	3.90	0.000	.0045356	.0136904
exp_ethnic	.0135012	.0038842	3.48	0.001	.0058884	.0211141
imp_ethnic	.008487	.0038936	2.18	0.029	.0008556	.0161184
exp_cor	.0056307	.0038573	1.46	0.144	-.0019294	.0131908
imp_cor	.0060069	.0038689	1.55	0.121	-.001576	.0135898
exp_law	-.0175736	.0047358	-3.71	0.000	-.0268557	-.0082916
imp_law	.0011323	.0047376	0.24	0.811	-.0081533	.0104179
_cons	-32.16238	.3093067	-103.98	0.000	-32.76861	-31.55615

Table A3.6. Random Effects GLS Estimation Results- VI

Random-effects GLS regression	Number of obs = 190640
Group variable: pair_id	Number of groups = 17103

R-sq: within = 0.0876

Obs per group: min = 1

between = 0.5623

avg = 11.1

overall = 0.5062

max = 15

Wald chi2(24) = 38275.19

corr(u_i, X) = 0 (assumed)

Prob > chi2 = 0.0000

ltshare	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
lgdp_exp	.406747	.0090585	44.90	0.000	.3889927	.4245012
lgdp_imp	1.050632	.0085588	122.75	0.000	1.033857	1.067407
lpop_exp	.061811	.0147207	4.20	0.000	.032959	.0906631
lpop_imp	.1078116	.013535	7.97	0.000	.0812835	.1343397
larea_exp	-.1835595	.010189	-18.02	0.000	-.2035294	-.1635895
larea_imp	-.1329168	.0097671	-13.61	0.000	-.1520599	-.1137737
ldist	-1.317987	.0235051	-56.07	0.000	-1.364057	-1.271918
landlocke~xp	.013992	.0418011	0.33	0.738	-.0679365	.0959206
landlocke~mp	-.4874755	.04184	-11.65	0.000	-.5694804	-.4054706
comlang	.9144726	.046033	19.87	0.000	.8242496	1.004696
border	1.273233	.105693	12.05	0.000	1.066078	1.480387
fta	.0593665	.0460642	1.29	0.197	-.0309177	.1496506
exp_govst	-.0282387	.0021428	-13.18	0.000	-.0324385	-.0240388
imp_govst	-.0130756	.0021228	-6.16	0.000	-.0172361	-.008915
exp_iconf	.0147099	.0024115	6.10	0.000	.0099834	.0194363
imp_iconf	.0112363	.002373	4.73	0.000	.0065852	.0158874
exp_ethnic	.0129588	.0038838	3.34	0.001	.0053466	.0205709
imp_ethnic	.0075489	.0038943	1.94	0.053	-.0000838	.0151817
exp_cor	.0143528	.0040325	3.56	0.000	.0064493	.0222563
imp_cor	.0125686	.0040357	3.11	0.002	.0046587	.0204785
exp_law	-.0080299	.0049005	-1.64	0.101	-.0176347	.0015749

imp_low	.0087522	.004908	1.78	0.075	-.0008674	.0183717
exp_burq	-.0385485	.0049101	-7.85	0.000	-.048172	-.0289249
imp_burq	-.031089	.0048832	-6.37	0.000	-.0406598	-.0215182
_cons	-32.33432	.3091342	-104.60	0.000	-32.94021	-31.72843

Table A3.7. Random Effects GLS Estimation Results- VII

Random-effects GLS regression		Number of obs		=	190640	
Group variable: pair_id		Number of groups		=	17103	
R-sq: within = 0.0876		Obs per group: min		=	1	
between = 0.5625		avg		=	11.1	
overall = 0.5064		max		=	15	
Wald chi2(26) = 38757.27						
corr(u_i, X) = 0 (assumed)		Prob > chi2		=	0.0000	
ltshare	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
lgdp_exp	.3904357	.0090768	43.01	0.000	.3726454	.408226
lgdp_imp	1.036197	.0085696	120.92	0.000	1.019401	1.052993
lpop_exp	.0639753	.0146663	4.36	0.000	.0352298	.0927207
lpop_imp	.1062725	.0134845	7.88	0.000	.0798434	.1327017
larea_exp	-.1800816	.0101512	-17.74	0.000	-.1999776	-.1601857
larea_imp	-.1285449	.0097321	-13.21	0.000	-.1476194	-.1094704
ldist	-1.316256	.0234115	-56.22	0.000	-1.362142	-1.270371
landlocke~xp	-.0071949	.0416557	-0.17	0.863	-.0888386	.0744488
landlocke~mp	-.5063601	.0416893	-12.15	0.000	-.5880695	-.4246506
comlang	.9116231	.045849	19.88	0.000	.8217607	1.001486
border	1.284989	.1052675	12.21	0.000	1.078668	1.491309
fta	.0575859	.0458816	1.26	0.209	-.0323404	.1475121

exp_govst	-.0257907	.0021704	-11.88	0.000	-.0300445	-.0215369
imp_govst	-.0109112	.002148	-5.08	0.000	-.0151212	-.0067012
exp_iconf	.0111274	.0024316	4.58	0.000	.0063616	.0158933
imp_iconf	.0073759	.0023958	3.08	0.002	.0026801	.0120716
exp_ethnic	.0160096	.0038887	4.12	0.000	.008388	.0236313
imp_ethnic	.0101465	.0038966	2.60	0.009	.0025093	.0177837
exp_cor	.0088185	.0040823	2.16	0.031	.0008174	.0168196
imp_cor	.0078852	.0040727	1.94	0.053	-.0000972	.0158676
exp_law	-.0021553	.004914	-0.44	0.661	-.0117866	.0074759
imp_law	.0141598	.0049194	2.88	0.004	.0045179	.0238017
exp_burq	-.0567941	.0051429	-11.04	0.000	-.066874	-.0467141
imp_burq	-.0499196	.0051213	-9.75	0.000	-.0599571	-.0398821
exp_demacc	.0345887	.0029555	11.70	0.000	.028796	.0403814
imp_demacc	.0347798	.0029243	11.89	0.000	.0290482	.0405114
_cons	-31.91205	.3089346	-103.30	0.000	-32.51755	-31.30655

Table A3.8. Random Effects GLS Estimation Results- VIII

Random-effects GLS regression	Number of obs	=	185203
Group variable: pair_id	Number of groups	=	16733
R-sq: within = 0.0890	Obs per group: min =		1
between = 0.5612	avg =		11.1
overall = 0.5049	max =		15
Wald chi2(28)	=	38229.83	
corr(u_i, X) = 0 (assumed)	Prob > chi2	=	0.0000
ltshare	Coef.	Std. Err.	z P> z [95% Conf. Interval]
lgdp_exp	.3853171	.0093866	41.05 0.000 .3669198 .4037144

lgdp_imp		1.027155	.0088321	116.30	0.000	1.009845	1.044466
lpop_exp		.0622302	.0149345	4.17	0.000	.0329592	.0915013
lpop_imp		.1174206	.0136521	8.60	0.000	.0906629	.1441782
larea_exp		-.1631344	.0105953	-15.40	0.000	-.1839007	-.142368
larea_imp		-.1252178	.0101603	-12.32	0.000	-.1451316	-.105304
ldist		-1.344323	.0237546	-56.59	0.000	-1.390881	-1.297765
landlocke~xp		-.0011267	.0416906	-0.03	0.978	-.0828387	.0805854
landlocke~mp		-.5111375	.0417373	-12.25	0.000	-.5929411	-.4293339
comlang		.9142985	.0465127	19.66	0.000	.8231352	1.005462
border		1.241021	.1051225	11.81	0.000	1.034985	1.447057
fta		.0448444	.0463855	0.97	0.334	-.0460696	.1357583
exp_govst		-.0267915	.0022144	-12.10	0.000	-.0311317	-.0224513
imp_govst		-.0107976	.0021915	-4.93	0.000	-.0150928	-.0065024
exp_iconf		.009903	.0024971	3.97	0.000	.0050088	.0147972
imp_iconf		.0074341	.002459	3.02	0.003	.0026146	.0122537
exp_ethnic		.0208461	.003956	5.27	0.000	.0130926	.0285996
imp_ethnic		.0095361	.0039656	2.40	0.016	.0017635	.0173086
exp_cor		.0060892	.0041705	1.46	0.144	-.0020849	.0142632
imp_cor		.0059145	.0041606	1.42	0.155	-.0022403	.0140692
exp_law		-.0097434	.0050711	-1.92	0.055	-.0196826	.0001959
imp_law		.0152161	.0050731	3.00	0.003	.0052729	.0251592
exp_burq		-.0565314	.005242	-10.78	0.000	-.0668054	-.0462574
imp_burq		-.0483714	.0052182	-9.27	0.000	-.058599	-.0381439
exp_demacc		.038873	.0030537	12.73	0.000	.0328879	.0448581
imp_demacc		.0335053	.0030292	11.06	0.000	.0275681	.0394425
exp_pr		-.0037711	.0044613	-0.85	0.398	-.012515	.0049729
imp_pr		-.0162849	.0043517	-3.74	0.000	-.024814	-.0077558
_cons		-31.64824	.3157001	-100.25	0.000	-32.267	-31.02948

Table A3.9. Random Effects GLS Estimation Results- IX

Random-effects GLS regression		Number of obs		=	185203	
Group variable: pair_id		Number of groups		=	16733	
R-sq: within = 0.0884		Obs per group: min =			1	
between = 0.5685		avg =			11.1	
overall = 0.5107		max =			15	
Wald chi2(30)				=	39105.74	
corr(u_i, X) = 0 (assumed)		Prob > chi2		=	0.0000	
ltshare	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
lgdp_exp	.3079408	.009822	31.35	0.000	.28869	.3271916
lgdp_imp	.9767165	.009213	106.01	0.000	.9586592	.9947737
lpop_exp	.1104409	.0150431	7.34	0.000	.0809569	.1399249
lpop_imp	.1338817	.01372	9.76	0.000	.106991	.1607723
larea_exp	-.150396	.0105849	-14.21	0.000	-.1711419	-.12965
larea_imp	-.1085615	.010162	-10.68	0.000	-.1284786	-.0886443
ldist	-1.361123	.0237143	-57.40	0.000	-1.407602	-1.314644
landlocke~xp	-.0918514	.0417473	-2.20	0.028	-.1736745	-.0100282
landlocke~mp	-.5839079	.041833	-13.96	0.000	-.6658991	-.5019168
comlang	.8855216	.0464292	19.07	0.000	.7945221	.9765211
border	1.229025	.104906	11.72	0.000	1.023413	1.434637
fta	.0361459	.0462918	0.78	0.435	-.0545843	.126876
exp_govst	-.0272089	.0022103	-12.31	0.000	-.0315411	-.0228767
imp_govst	-.0116437	.0021876	-5.32	0.000	-.0159312	-.0073561
exp_iconf	.0040512	.002503	1.62	0.106	-.0008547	.008957
imp_iconf	.0036739	.0024647	1.49	0.136	-.0011568	.0085046

exp_ethnic	.0219992	.0039488	5.57	0.000	.0142596	.0297388
imp_ethnic	.0126048	.0039601	3.18	0.001	.0048432	.0203663
exp_cor	.0125364	.0041743	3.00	0.003	.0043549	.0207178
imp_cor	.0143823	.0041647	3.45	0.001	.0062196	.022545
exp_law	.0014293	.005079	0.28	0.778	-.0085254	.011384
imp_law	.022084	.0050744	4.35	0.000	.0121383	.0320297
exp_burq	-.0516377	.0052352	-9.86	0.000	-.0618985	-.041377
imp_burq	-.0443037	.005216	-8.49	0.000	-.054527	-.0340805
exp_demacc	.0288253	.0030709	9.39	0.000	.0228065	.0348441
imp_demacc	.0252152	.0030496	8.27	0.000	.0192381	.0311922
exp_pr	.0633746	.0053471	11.85	0.000	.0528946	.0738547
imp_pr	.015742	.0052406	3.00	0.003	.0054706	.0260133
exp_cl	-.1573074	.006801	-23.13	0.000	-.170637	-.1439777
imp_cl	-.0777389	.0067649	-11.49	0.000	-.0909978	-.0644799
_cons	-29.31291	.3276905	-89.45	0.000	-29.95517	-28.67065

REFERENCES

Acemoglu, D., S. Johnson, J. A. Robinson. (2001). The Colonial Origins of Comparative Development: An Empirical Investigation. *American Economic Review*. 91.5, 1369-1401.

Acemoglu, D., S. Johnson, J. A. Robinson. (2002). Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution. *Quarterly Journal of Economics*. 117.4, 1231-1294.

Acemoglu, D., S. Johnson, J. A. Robinson. (2005a). Institutions As a Fundamental Cause of Long-Run Growth. P. Aghion and S. N. Durlauf (Ed.). Chapter 6 in *Handbook of Economic Growth, Volume 1A*. Elsevier, 2005, 385-472.

Acemoglu, D. and S. Johnson. (2005b). Unbundling Institutions. *Journal of Political Economy*, 113.5, 949-995.

Acemoglu et al. (2005c). The Rise of Europe: Atlantic Trade, Institutional Change, and Economic Growth. *American Economic Review*. 95.3, 546-579.

Akerlof, G. (1970). The Market for Lemons: Qualitative Uncertainty and the Market Mechanism. *Quarterly Journal of Economics*. 84, 488-500.

Alchian, A. (1961). *Some Economics of Property*. Santa Monica, CA: The Rand Corporation.

Alchian, A. and Demsetz, H. (1972). Production, Information Cost, and Economic Organization. *American Economic Review*. 777-795.

Alesina, A. and Rodrik, D. (1994). Distributive Politics and Economic Growth. *The Quarterly Journal of Economics*. 109.2, 465-490

Anderson, J. E. (1979). A Theoretical Foundation for the Gravity Equation. *The American Economic Review*. 69.1, 106-116.

Anderson, J. E. and E. van Wincoop, E. (2003). Gravity with Gravitas: A Solution to the Border Puzzle. *American Economic Review*. 93.1, 170–192.

Anderson, J. E. (2008). Does Trade Foster Contract Enforcement?, Brown University, *mimeo*.

Anderson, J. E. and Y. V. Yotov. (2009). The Changing Incidence of Geography.

Armstrong, D. (2009). Measurement in the Social Sciences (TT 2009), Appendix 2.1: PCA Extended Examples – Stata, *University of Oxford Department of Politics and International Relations*. Web Link: www.quantoid.net/appendix2.1.pdf.

Aysan, A. F. (2007a). Yönetişim ve Kurumlar Kavramlarının İktisat Literatüründeki Yükselişi Üzerine Bir Değerlendirme. *Uluslararası Ekonomi ve Dış Ticaret Politikaları*. 1.2, 27-52.

Aysan, A. F.; M. K. Nabli and M. A. Véganzonés-Varoudakis. (2007b). Governance Institutions and Private Investment: An Application to The Middle East and North Africa. *The Developing Economies*. 45.3, 339-377.

Aysan, A. F.; O. F. Baykal and M. A. Véganzonés-Varoudakis. (2011). The Effects of Convergence in Governance on Capital Accumulation in the Black Sea Economic Cooperation Countries. *CERDI Etudes et Documents*. E 2011.03, 1-36.

Azarbayjani et al. (24-26 June 2010). The Effect of Corruption on Bilateral Trade of Selected Countries in the Middle East, *9th International Conference of MEEA*. Istanbul, 1-15.

Baier, S. L. and J. H. Bergstrand. (2001). The Growth of World Trade: Tariffs, Transport Costs, and Income Similarity. *Journal of International Economics*. 53, 1-27.

Baier, S. L., G. P. Dwyer Jr., and R. Tamura (2006). Factor Returns, Institutions and Geography: A View From Trade. *IIIS Discussion Paper No.* 166, 1-56.

Balassa, B. (1961). The Factor-Price Equalization Controversy. *Weltwirtschaftliches Archiv*. 87, 111-123.

Bandyopadhyay, S. and S. Roy. (2006). Corruption and Trade Protection: Evidence from Panel Data.

Becker, G. S. (1983). A Theory of Competition Among Pressure Groups for Political Influence. *The Quarterly Journal of Economics*. 98.3, 371-400.

Ben-David, D. (1993). Equalizing Exchange: Trade Liberalization and Income Convergence. *The Quarterly Journal of Economics*. 108.3, 653-679.

Bergstrand, J. (1985). The Gravity Equation in International Trade: Some Microeconomic Foundations and Empirical Evidence. *Review of Economics and Statistics*. 67.3, 474-481.

Besley T. and Kudamatsu M. (2008). Making Autocracy Work. E. Helpman (Ed.). Chapter 11 in *Institutions and Economic Performance*. Cambridge, MA: Harvard University Press, 2008, 452-511.

Bhagwati, J. N. (1958). Immiserizing Growth: A Geometrical Note. *Review of Economic Studies*. 25.3, 201-205.

Bhagwati, J. N. (1969). Optimal Policies and Immiserizing Growth. *American Economic Review*. 59.5, 967-970.

Bhagwati, J. (1972). The Heckscher-Ohlin Theorem in the Multi-Commodity Case. *Journal of Political Economy*. 80.5, 1052-1055.

Buchanan, J. M. (1965). An Economic Theory of Clubs. *Economica*. 32.125, 1-14.

Choi, Y-S. and P. Krishna. (2004). The Factor Content of Bilateral Trade: An Empirical Test. *Journal of Political Economy*. 112.4, 887-914.

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

Coe, D. T. and E. Helpman. (1995). International R&D Spillovers. *European Economic Review*. 39, 859-887.

Commons, J. R. (1923). Wage Theories and Wage Policies. *American Economic Review*. 13.1, 110-117.

Commons, J. R. (1931). Institutional Economics. *American Economic Review*. 21.4, 648-657.

Deardorff, A. (1980). The General Validity of the Law of Comparative Advantage. *Journal of Political Economy*. 88, 941-957.

Deardorff, A. (1998). Determinants of Bilateral Trade: Does Gravity Work in a Neoclassical World? J. A. Frankel (Ed.) *The Regionalization of the World Economy (NBER)*. University of Chicago Press, 1998, 7-32.

Demsetz, H. (1967). Toward a Theory of Property Rights. *The American Economic Review*. 57.2, 347-359.

Dikkaya, M. and M. Orhan. (2004). Economies of the Black Sea Economic Cooperation (BSEC) Countries and their Bilateral Trade. *Journal of Economic and Social Research*. 6.2, 63-86

Dollar, D. (1992). Outward-oriented Developing Economies Really Do Grow More Rapidly: Evidence From 95 LDCs, 1976-1985. *Economic Development and Change*. 40, 523-544.

Dollar, D. and A. Kraay. (2003). Institutions, Trade and Growth: Revisiting the Evidence. *World Bank Policy Research Working Paper* 3004.

Easterly, W. and R. Levine. (2001). It's Not Factor Accumulation: Stylized Facts and Growth Models. *World Bank Economic Review*.

Easterly, W. (2002). *The Elusive Quest for Growth*. Cambridge, MA: MIT Press.

Easterly, W. and R. Levine. (2003). Tropics, Germs, and Crops: How Endowments Influence Economic Development. *Journal of Monetary Economics*. 50, 3-39.

Easterly, W. (2005). National Policies and Economic Growth: A Reappraisal. P. Aghion and S. N. Durlauf (Ed.). Chapter 15 in *Handbook of Economic Growth, Volume 1A*. Elsevier, 2005, 1-46.

Easterly, W., J. Ritzen and M. Woolcock. (2006). Social Cohesion, Institutions and Growth. *Economics & Politics*, 18.2, 103-120.

Eaton, J. and S. Kortum. (2002). Technology, Geography and Trade. *Econometrica*. 70.5, 1741-1779.

Edwards, S. (1993). Openness, Trade Liberalization and Growth in Developing Countries. *Journal of Economic Literature*. 31.3, 1358-1393.

Edwards, S. (1997a). Openness, Trade Liberalization and Income Distribution. *NBER Working Paper No. 5978*.

Edwards, S. (1997b). Trade Policy, Growth and Income Distribution. *The American Economic Review*. Papers and Proceedings of the Hundred and Fourth Annual Meeting of the American Economic Association. 87.2, 205-210.

Ehrlich, I. and F. T. Lui. (1999). Bureaucratic Corruption and Endogenous Economic Growth. *Journal of Political Economy*. 107, 270-293.

Engerman, S. and K. L. Sokoloff. (1997). Factor Endowments, Institutions, and Differential Paths of Growth Among New World Economies. S. Haber (Ed.). Chapter 10 in *How Latin America Fell Behind Essays on the Economic Histories of Brazil and Mexico*. Stanford, CA: Stanford University Press, 1997, 260-304.

Engerman, S. and K. L. Sokoloff (2005). Colonialism, Inequality and Long-run Paths of Development. *NBER Working Paper Series No. 11057*, Cambridge, MA.

Esfahani, H. S. and M. T. Ramirez. (2003). Institutions, Infrastructure, and Economic Growth. *Journal of Development Economics*. 70, 443-477.

- Evans, J.; P. Rauch. (2000). Bureaucratic Structure and Economic Performance in Less Developed Countries. *Journal of Public Economics*. 75, 49-71.
- Feenstra, R. C. (1996). Trade and Uneven Growth. *Journal of Development Economics*. 49, 229-256.
- Feenstra, R. C. (2004). *Advanced International Trade Theory and Evidence*. Princeton University Press.
- Fisman, R. and R. Gatti. (2000). Decentralization and Corruption: Evidence Across Countries. *World Bank Policy Research Working Paper No. 2290*.
- Francois, J. and M. Manchin (2007). Institutions, Infrastructure, and Trade. *World Bank Policy Research Working Paper No. 4152*.
- Frankel, J. A. and D. Romer. (1999). Does Trade Cause Growth? *American Economic Review*. 89.3, 379-399.
- Galbraith, J. K. (1958; 1998). *The Affluent SocietyFortieth Anniversary Edition*. New York, NY: Houghton Mifflin Company.
- Gallup, J. L., Sachs, J. D. and Mellinger, A. D. (1999a). Geography and Economic Development. *International Regional Science Review*. 22.2, 179-232.
- Gallup, J. L., Sachs, J. D. and Mellinger, A. D. (1999b). Climate, Water Navigability, and Economic Development. *CID Working Paper No. 24*, Cambridge, MA: Center for International Development, Harvard University.
- Gatti, R. (1999). Corruption and Trade Tariffs, or a Case for Uniform Tariffs. *World Bank Policy Research Working Paper No. 2216*.
- Gawande, K. And U. Bandyopadhyay. (2000). Is Protection for Sale: Evidence on the Grossman-Helpman Theory of Endogenous Protection. *The Review of Economics and Statistics*. 82.1, 139-152.

Glaeser, E. L., R. La Porta, F. Lopez-de-Silanes, and A. Shleifer. (2004). Do Institutions Cause Growth? *NBER Working Paper No. 10568*.

Gradstein, M. (2004). Governance and Growth. *Journal of Development Economics*. 73, 505-518.

Greene, W. H. (2004). *Econometric Analysis*. International Edition (LPE). India: Pearson Education Inc.

Greif, A. (1992). Institutions and International Trade: Lessons from the Commercial Revolution. *The American Economic Review*. Papers and Proceedings of the Hundred and Fourth Annual Meeting of the American Economic Association. 82.2, 128-133.

Greif, A. (1993). Contract Enforceability and Economic Institutions in Early Trade: The Maghribi Traders' Coalition. *The American Economic Review*. 83.3, 525-548.

Grossman, G. M. and E. Helpman. (1994). Protection for Sale. *American Economic Review*. 84.4, 833-850.

Gupta, S.; H. Davoodi and T. Alonso. (1998). Does Corruption Affect Income inequality and Poverty? *IMF Working Paper No. WP/98/76*.

Hamilton, W. (1919). The Institutional Approach to Economic Theory. *American Economic Association*, 309-318.

Hardin, G. (1968). The Tragedy of the Commons. *Science*. 162.3859, 1243-1248.

Harrison, A. (1996). Openness and Growth: A Time-series, Cross-section Analysis for Developing Countries. *Journal of Development Economics*. 48, 419-447.

Haveman, J. and D. Hummels. (2004). Alternative Hypotheses and the Volume of Trade: The Gravity Equation and the Extent of Specialization. *Canadian Journal of Economics*. 37.1, 199-218.

Helpman, E. (1984). The Factor Content of Foreign Trade. *The Economic Journal*. 94.373, 84-94.

Helpman, E. (1999). The Structure of Foreign Trade. *The Journal of Economic Perspectives*. 13.2, 121-144.

Helpman, E. (Ed.). (2008). *Institutions and Economic Performance*. Cambridge, MA: Harvard University Press.

Hochman, G. and C. Tabakis. (2007). Trade, Institutions and Economies in Transition.

Hodgson, G. M. (2006). What Are Institutions? *Journal of Economic Issues*. 40.1, 1-25.

Howitt, P. (2000). Endogenous Growth and Cross-Country Income Differences. *The American Economic Review*. 90.4, 829-846.

Islam, R. and C. E. Montenegro. (2002). What Determines the Quality of Institutions? *World Bank Policy Research Working Paper No. 2764*. The World Bank, Washington, D.C.

Jensen M. C. and Meckling W. H. (1976). Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. *Journal of Financial Economics*. 3.4, 305-360.

Jones, R. W. (1956-1957). Factor Proportions and Heckscher-Ohlin Theorem. *The Review of Economic Studies*. 24.1, 1-10.

Jones, C. I. (1995). R&D-Based Models of Economic Growth. *The Journal of Political Economy*. 103.4, 759-784.

Kahn, A. (1988). *The Economics of Regulation Principles and Institutions vol. I-II*, The MIT Press.

Kaufmann, D.; A. Kraay and P. Zoido-Lobaton. (1999). Governance Matters. *World Bank Policy Research Working Paper No. 2195*. The World Bank, Washington, D.C.

Kaufmann, D. and A. Kray (2001). Growth without Governance. *World Bank Policy Research Paper*. The World Bank, Washington, D.C.

Keller, W. (1998). Are International R&D Spillovers Trade-related? Analyzing Spillovers Among Randomly Matched Trade Partners. *European Economic Review*. 42, 1469-1481.

Klenow, P. J. and A. Rodriguez-Clare. (2004). Externalities and Growth. *NBER Working Paper Series No. 11009*, Cambridge, MA.

Knack, S. and P. Keefer. (1995). Institutions and Economic Performance: Cross Country Tests Using Alternative Institutional Measures. *Economics and Politics*. 7.3, 207–227.

Knack, S. and O. Azfar. (2003). Trade Intensity, Country Size and Corruption. *Economics of Governance*. 4, 1-18.

Knight, F. (1921). *Risk, Uncertainty and Profit*. Hart, Schaffner & Marx; Boston: Houghton Mifflin Company, The Riverside Press, Cambridge.

Koopmans, T. C. (1947). Measurement Without Theory. *Review of Economic Statistics*. 29.3, 161-172.

Krueger, A. (1974). The Political Economy of Rent-Seeking Society. *American Economic Review*. 64.3, 291-303.

Krugman, P. (1991). Increasing Returns and Economic Geography. *Journal of Political Economy*. 99.3, 483-499.

Krugman, P. (1999). The Role of Geography in Development. *International Regional Science Review*. 22.2, 142-161.

Krugman, P. (2009). The Increasing Returns Revolution in Trade and Geography. *American Economic Review*. 99.3, 561-571.

La Porta R.; F. L. Silanes; A. Shleifer and R. Vishny. (1999). Quality of Government. *The Journal of Law, Economics, and Organization*. 15, 222-279.

Laffont J. and N. Tchetche. (1999). Competition and Corruption in Agency Relationship. *Journal of Development Economics*. 60, 271-295.

Laffont, J. (2006). Corruption and Development. Banerjee et al. (Ed.). Chapter 11 in *Understanding Poverty*. Oxford University Press, 2006.

Laffont, J. and J. Tirole. (1991). The Politics of Government Decision-Making: A Theory of Regulatory Capture. *Quarterly Journal of Economics*. 106.4, 1089-1127.

Lavallee, E. (2004). Governance, Corruption and Trade: A North-South Approach. EURISCO, Université Paris-Dauphine, *Mimeo*, 1-25.

Larrain, F. and J. Tevares. (2001). Can Openness Deter Corruption? *Center for International Development, Harvard University, Mimeo*.

Leamer, E. E. (1980). The Leontief Paradox, Reconsidered. *Journal of Political Economy*. 88.3, 495-503.

Leite, C.; J. Weidmann. (1999). Does Mother Nature Corrupt? Natural Resources, Corruption, and Economic Growth. *IMF Working Paper No. WP/99/85*.

Leontief, W. (1953). Domestic Production and Foreign Trade: The American Capital Position Re-examined. *Proc. American Philosophical Soc.* 97, 332-349.

Leontief, W. (1956). Factor Proportions and the Structure of American Trade: Further Theoretical and Empirical Analysis. *The Review of Economics and Statistics*. 38.4, 386-407.

Levchenko, A. A. (2004). Institutional Quality and International Trade. *IMF Working Paper No. WP/04/231*.

Li, D. (1996). The Welfare Effect of Trade in the Endogenous Growth Model. *The Canadian Journal of Economics*. 29.2, 384-388.

Mankiw, N. G.; D. Romer and D. N. Weil. (1992). A Contribution to the Empirics of Economic Growth. *Quarterly Journal of Economics*. 107.2, 407-437.

Mansfield, E. D. and E. Reinhardt. (2008). International Institutions and the Volatility of International Trade. *International Organization*. 62, 621-652.

Mauro, P. (1995). Corruption and Growth. *Quarterly Journal of Economics*. 110, 681–712.

McCallum, J. (1995). National Borders Matter: Canada-US Regional Trade Patterns. *American Economic Review*. 85, 615-623.

Mehanna, R. A. (2003). Do Politics and Culture Affect Middle East Trade? Evidence from the Gravity Model. *Review of Middle East Economics and Finance*. 1.2, 155-170.

Méon, P-G. and K. Sekkat. (2006). Institutional Quality and Trade: Which Institutions? Which Trade?

Miller, S. M. and Upadhyay, M. P. (2000). The Effects of Openness, Trade Orientation, and Human Capital on Total Factor Productivity. *Journal of Development Economics*. 63, 399-423.

Mitchell, W. C. et al. (1928). The Present Status and Future Prospects of Quantitative Analysis. *The American Economic Review*. 18.1, 28-45.

Mo, P. H. (2001). Corruption and Economic Growth. *Journal of Comparative Economics*. 29, 66–79.

Murphy, K. M., A. Shleifer and R. Vishny. (1991). The Allocation of Talent: Implications for Growth. *The Quarterly Journal of Economics*. 106, 503-530.

Myrdal, G. (1957). *Rich Lands and Poor: The Road to World Prosperity*. Harper & Brothers Publishers.

Nabli, M. K. and J. Nugent. (1989). The New Institutional Economics and Its Applicability to Development. *World Development*. 17.9, 1333-1347.

Nelson, R. R. and B. N. Sampat. (2001). Making Sense of Institutions as A Factor Shaping Economic Performance. *Journal of Economic Behavior and Organization*. 44, 31-54.

North, D. C. and R. P. Thomas. (1970). An Economic Theory of the Growth of the Western World. *The Economic History Review*. 23.1, 1-17.

North, D. C. and R. P. Thomas. (1973). *The Rise of the Western World: A New Economic History*. New York, NY: Cambridge University Press.

North, D. C. (1983). A Theory of Economic Change (Review). *Science*. 219.4581, 163-164.

North, D. C. (1990). *Institutions, Institutional Change and Economic Performance*. Cambridge, UK: Cambridge University Press.

O'Rourke, K. and J. G. Williamson. (1994). Late Nineteenth-Century Anglo-American Factor-Price Convergence: Were Heckscher and Ohlin Right? *Journal of Economic History*. 54.4, 892-916.

O'Rourke, K. H. and J. G. Williamson. (2000). When Did Globalization Begin? *NBER Working Paper Series No. 7632*, Cambridge, MA.

O'Rourke, K. H. (2001). Globalization and Inequality: Historical Trends. *NBER Working Paper Series No. 8339*, Cambridge, MA.

Olson, M. (1965). *The Logic of Collective Action*. Cambridge, MA: Harvard University Press.

Olson, M. (1982). *The Rise and Decline of Nations: Economic Growth, Stagflation and Social Rigidities*. New Haven, CT: Yale University Press.

Olson, M., S. Naveen and A. V. Swamy. (2000). Governance and Growth: A Simple Hypothesis Explaining Cross-Country Differences in Productivity Growth. *Public Choice*, 102.3-4, 341-364.

Ostrom, E. (1986). An Agenda for the Study of Insitutions. *Public Choice*. 48.1, 3-25.

Ostrom, E. (2005). *Understanding Institutional Diversity*. Princeton, NJ: Princeton University Press.

Paldam, M. (2002). The Cross-Country Pattern of Corruption: Economics, Culture and the Seesaw Dynamics. *European Journal of Political Economy*. 18.2, 215-40.

Peltzman, S. (1976). Towards a More General Theory of Regulation. *Journal of Law and Economics*. 19.2, 211-240.

Posner, R. A. (1980). A Theory of Primitive Society with Special Reference to Law. *Journal of Law and Economics*. 23.1, 1-53.

Redding, S. and A. J. Venables. (2004). Economic Geography and International Inequality. *Journal of International Economics*. 62, 53-82.

Rigobon, R. and D. Rodrik. (2004). Rule of Law, Democracy, Openness and Income: Estimating the Interrelationships. *NBER Working Paper Series No. 10750*, Cambridge, MA.

Rivera-Batiz, L. A. and P. M. Romer. (1991). Economic Integration and Endogenous Growth. *The Quarterly Journal of Economics*. 106.2, 531-555.

Rivera-Batiz, F. L. (2002). Democracy, Governance, and Economic Growth: Theory and Evidence. *Review of Development Economics*. 6.2, 225-47.

Rodriguez, F., D. Rodrik. (1999). Trade Policy and Economic Growth: A Skeptic's Guide To The Cross-National Evidence. *NBER Working Paper No. 7081*, 1-81.

Rodrik, D. (1999). Where Did All the Growth Go? External Shocks, Social Conflict and Growth Collapses. *Journal of Economic Growth*. 4, 385-412.

Rodrik, D. (2002). Institutions, Integration and Geography: In Search of the Deep Determinants of Economic Growth.

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

Roland, G. (2004). Understanding Institutional Change: Fast-Moving and Slow-Moving Institutions. *Studies in Comparative International Development*. 38.4, 109-131.

Rose, A. (2003). Which International Institutions Promote International Trade? *Review of International Economics*. Manuscript No. 3147.

Rutherford, M. (1995). The Old and the New Institutionalism: Can Bridges Be Built? *Journal of Economic Issues*. 29.2, 443-451.

Rutherford, M. (2001). Institutional Economics: Then and Now. *Journal of Economic Perspectives*. 15.3, 173-194.

Rybczynski, T. M. (1955). Factor Endowment and Relative Commodity Prices. *Economica*. 22.88, 336-341.

Sachs, J., A. Warner, A. Aslund and S. Fischer. (1995). Economic Reform and the Process of Global Integration. *Brooking Papers on Economic Activity*. 1995.1, 1-118.

Sachs, J. (2003). Institutions Don't Rule: A Refutation of Institutional Fundamentalism. *NBER Working Paper No. 9490*, Cambridge, MA.

Samuelson, P. and W. F. Stolper. (1941). Protection and Real Wages. *Review of Economic Studies*. 9, 58-73.

Samuelson, P. (1948). International Trade and Equalisation of Factor Prices. *Economic Journal*. 58.230, 163-184.

Samuelson, P. (1949). International Factor-Price Equalisation Once Again. *Economic Journal*. 59.234, 181-197.

Sandholtz, W. and W. Koetzle. (2000). Accounting for Corruption: Economic Structure, Democracy and Trade. *International Studies Quarterly*. 44, 31-50.

Schumpeter, J. A. (2004). *The Theory of Economic Development*. New Brunswick and London: Transaction Publishers. (10th Ed.)

Segura-Cayuela, R. (2006). *Essays on International Trade and Institutions*. Unpublished Doctoral Thesis. Massachusetts Institute of Technology, Cambridge, MA.

Shleifer, A. and R. Vishny. (1993). Corruption. *Quarterly Journal of Economics*. 108.3, 599–617.

Slaughter, M. J. (1997). Per Capita Income Convergence and the Role of International Trade. *The American Economic Review*, Papers and Proceedings of the Hundred and Fourth Annual Meeting of the American Economic Association. 87.2, 194-199

Smith, L. I. (26 February 2002). A Tutorial on Principal Components Analysis. Web Link: <http://ranger.uta.edu/~guerra/Smith02tutorial.pdf> .

Stata 11 Help Manual. (2011).

Stigler, G. (1971). The Theory of Economic Regulation. *Bell Journal of Economics*. 2.1, 3-21.

Stiglitz, J. E. (1986). The New Development Economics. *World Development*. 14.2, 257-265.

Tirole, J. (1996). A Theory of Collective Reputations (with Applications to the Persistence of Corruption and to Firm Quality). *Review of Economic Studies*. 63, 1-22.

Trefler, D. (1993). International Factor Price Differences: Leontief Was Right! *Journal of Political Economy*. 101.6, 961-987.

Trefler, D. (1995). The Case of the Missing Trade and Other Mysteries. *American Economic Review*. 85.5, 1029-1046.

Treisman, D. (2000). The Causes of Corruption: A Cross National Study. *Journal of Public Economics*. 76, 399-457.

Tullock, G. (1983). The Rise and Decline of Nations by Mancur Olson (Review). *Public Choice*. 40.1, 111-116.

Vanek, J. (1968). The Factor Proportions Theory: The N-Factor Case. *Kyklos*. 21, 749-755.

Veblen, T. (1898). Why Economics is Not an Evolutionary Science? *The Quarterly Journal of Economics*, 12.4, 373-397.

Veblen, T. (1899). *The Theory of the Leisure Class: An Economic Study in the Evolution of Institutions*. New York: MacMillan (reprint: Dover Publications, New York, 1994).

Venables, A. J. (2005). Spatial Disparities in Developing Countries: Cities, Regions, and International Trade. *Journal of Economic Geography*. 5, 3-21.

Ventura, J. (1997). Growth and Interdependence. *The Quarterly Journal of Economics*. 112.1, 57-84.

Warner, J. T. (2005), Lecture Notes on Panel Data (#7), Clemson University.

Weber, M. (1978). *Economy and Society*. G. Ruth and C. Wittich (Ed.). University of California Press.

Wei, S. J. (2000). Natural Openness and Good Government. *World Bank Working Paper No. 2421*.

Williamson, O. E. (1979). Transaction-Cost Economics: The Governance of Contractual Relations. *Journal of Law and Economics*. 22.2, 233-261.

Williamson, O. E. (1985). *The Economic Institutions of Capitalism*. New York, NY: Free Press.

Williamson, O. E. (2005a). The Economics of Governance. *UCLA Mimeo*.

Williamson, O. E. (2005b). The Economics of Governance. *AEA Papers and Proceedings, American Economic Review*. 95.2, 1-18.

Wooldridge, J. M. (2002). *Econometric Analysis of Cross Section and Panel Data*. Cambridge, MA: The MIT Press.

World Trade Organization. (2004). World Trade Report 2004. Governance and Institutions, 176-186.

Young, A. (1998). Growth Without Scale Effects. *Journal of Political Economy*. 106.1, 41-63.