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# THE ROLE OF INSTITUTIONAL QUALITY ON BILATERAL EXPORTS

by

Sumaiya Binta Islam

B.S., BRAC University, Dhaka, Bangladesh, 2019

A Thesis

Submitted in Partial Fulfillment of the Requirements for the  
Master of Science Degree

School of Analytics, Finance and Economics  
in the Graduate School  
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August 2023

THESIS APPROVAL

THE ROLE OF INSTITUTIONAL QUALITY ON BILATERAL EXPORTS

by

Sumaiya Binta Islam

A Thesis Submitted in Partial  
Fulfillment of the Requirements  
for the Degree of  
Master of Science  
in the field of Economics

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## AN ABSTRACT OF THE THESIS OF

Sumaiya Binta Islam, for the Master of Science degree in Economics, presented on May 26, 2023, at Southern Illinois University Carbondale

TITLE: THE ROLE OF INSTITUTIONAL QUALITY ON BILATERAL EXPORTS

MAJOR PROFESSOR: Dr. Sajal Lahiri

This paper empirically examines the effect of institutional quality on trade considering the gravity equation model. Taking data for 252 countries covering the period of 19 years from 1996 to 2014, the research has been done with two stage regression analysis. In the first stage, we estimate the effect of gravity factors that either benefit or hinder trade along with OECD membership and Linder's effect by Poisson-Pseudo-Maximum-Likelihood (PPML) estimator with importer- time, and exporter- time fixed effects. Taking the estimated exporter- time fixed effects from the first stage, we regress it with institutional variables in the second stage by OLS method with country and time fixed effects. Results indicate that institutional quality has a significant and positive impact on bilateral export with mostly 1% and 5% significance level. Interestingly, our study also shows that Linder's effect is negative only for trade among the OCED countries.

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# CHAPTER 1

## INTRODUCTION

Apart from factors we have studied in gravity equation, there are other components that affect the trade volume that were unnoticed. Beside the economic influence on trade, political, and government policies have a major influence on trade growth as today's negotiations and agreements have an unspoken goal in long term benefits. International trade consists of contracts between trading partners that belong to different administrative and legal systems, institutional settings, different work and societal culture, currencies and even speak different languages. In addition to all this, distance between the trading parties often creates uncertainties with product delivery. Besides, contract enforcement, property rights, investor protection etc. are some of the crucial factors to attract investors and establish trade. The absence of these securities raises frictions in the process of international trade. Effective institutions of trading countries can lessen these uncertainties and friction. Anderson and Marcouiller (2002) say that poor legal system lacks transparency and impartiality which hinder trade as much as hidden tax or tariff. Moreover, corruption is the second major barrier after tax and their findings prove that costs associated with weak institutions are the reason countries trade lower than expected.

Countries that abide by open economic system, foreign trade is one of the principal drivers of economic expansion. According to World Bank (2017), most countries' major share of Gross Domestic Product (GDP), foreign exchange profits, reduction of poverty and other related vulnerabilities, and encouragement of internalization all come from trade. The condition of a political system, government, and private institutions and even the government itself has a huge impact while trading. According to Heo et al. (2017) the definition of institution is given by North (1994) as a humanly devised constraint that structures human interaction. They are made

up of formal constraints (e.g., rules, laws, and constitutions), informal constraints (e.g., norms of behavior, conventions, and self-imposed codes of conduct), and their enforcement characteristics. The term institution is not limited to this definition while interacting with the pattern of trade, rather has extensive aspects. Insecurity addressed by Anderson and Marcouiller (2002), property rights by de Groot et al. (2004), emphasis of contract enforcement by Levchenko (2007), democracy (Yu, 2010) etc. are some of the elements of good institutions.

This paper takes government and their political institutions into account as we are interested in measuring the actual impact of it on bilateral export. According to the World Bank, the definition of a good government system is where it comprises the traditions and institutions by which a country is exercised. The process by which government are selected, monitored, and replaced; the capacity of the government to effectively formulate and implement sound policies; and taking the consideration of the the respect of citizens and the state for the institutions that govern economic and social interactions among them.” Database constructed for good government by Kaufmann et al. (2002) has been used in almost all papers. Each indicator has attributes related to the quality of governance. They are useful tools to measure either the political process, success of governance, or the quality of the policies.

1. ‘Voice and Accountability’ refers to the power of citizens in selecting the government, the right to hold the government accountable for the actions taken, freedom of expression and freedom of press etc.
2. ‘Control of Corruption’ reflects the extent to which lawless and unfair behavior in public-private interactions, taking consideration of small to large corruption, and usage of public power for private gain.



3. 'Political Stability' refers to the possibility of the government will be overthrown by unconstitutional means such as violence, political or military coup. It hinders the continuity of policy and stability of the economic environment.
4. 'Rule of Law' indicates the quality of the legal system, the extent to which people rely on and accept the rules of society, whether it is fair, free from private domination etc. It ensures property rights and the relation between law enforcement party and common people.
5. 'Regulatory Quality' focuses on the quality of implemented policies. They are mainly government policies to enable and promote private sector development.
6. 'Government Effectiveness' measures the quality and independence of the bureaucracy. It also indicates the ability of policy formulation.

Linder (1961) hypothesized that countries with similar income levels produce and consume differentiated yet similar quality goods and services. Linder's theory introduces a demand-based concept of trade that is opposite of Heckscher- Ohlin's supply-based theory involving factor endowment. As demand and choice of commodities are similar in high income countries, they should trade high quality but distinguished products. On the contrary, Heckscher and Ohlin suggest that countries will trade those goods where they have comparative advantage with factors of production. High income countries produce mostly capital-intensive goods compared to the labor- intensive commodities. Hence, countries with dissimilar income should trade more, which is the opposite of Linder hypothesis. A negative coefficient will prove Linder's hypothesis.

Another leading variable, membership of OCED has been used in studies and Rose (2005) addresses that membership in the OECD increases trade. Later, De Groot et al. (2005)

argued that OECD does not have the formal power to liberalize trade, and the member countries should not trade disproportionately. They observed that membership in OECD has positive impact on trade without the effect of institutional quality and concluded that OECD has positive effect on trade because those countries already have better domestic institutional quality. Thus, OECD can be a proxy for institutional quality. In this study, we are more interested to investigate the effect of the interaction term between membership in OECD and Linder's effect.

This paper investigates two questions empirically: how the quality of institutions affects the volume of bilateral exports? And does the Linder hypothesis apply to non-OECD trade? The remainder of this paper is organized as follows. After discussing previous literature in sector 2, Section 3 introduces our estimation methodology and gravity analysis followed by data source in section 4. Next, we discuss the results section 5 presents, and the final section summarizes the main findings of the analysis.

## CHAPTER 2

### REVIEW OF RELATED LITERATURE

The association between institutions and international trade flows has caught a great deal of attention in recent times. Anderson and Marcouiller (2002) were among the pioneers to demonstrate that the institutional quality of the trading nations had a beneficial impact on bilateral trade volumes. Using data from 48 countries, they show that if transparency and impartiality index increase by 10%, it escalates the trade volume by 5%, *ceteris paribus*. Subsequently, with the help of gravity model and taking data set from more than 100 countries de Groot et al. (2004) confirms their findings stating that institutional quality has a positive and considerable effect on bilateral trade flow. They focus on the country- specific quality of institutions and bilateral homogeneity of governance, and the result indicates that institutions highly impact dissimilar goods.

Similarly, Abreo et al. (2021) also used the homogeneity concept as institutional distance. They examined on one hand the influence of institutional quality, and on other hand the influence of the institutional distance between Colombia to 136 of its trading partners. With empirical evidence they suggested that improving the quality of institutions should be the primary step for enhancing trade by Colombian government, as the country's institutional distance is far from the world's average which affects its export.

According to Yusuf et al. (2021) talks about the impact of institutional quality on bilateral trade flow between Malaysia and other 25 African countries of Organization of Islamic Cooperation (OIC) member countries. They simplified the analysis by taking only four indicators of good governance i.e., government effectiveness, level of corruption, regulatory quality, and level of political stability. Gravity variables consist of population size, common language,

common colony, GDP, Linder, exchange rates and total trade. The result is parallel to other papers, and it confirms that institutional quality does significantly affect trade of Malaysia with OIC countries.

Later, in another paper de Groot, Linders and Rietveld (2005) try to solve two existing puzzles in the gravity literature; first puzzle was explicitly identified in the recent study by Rose A. K. (2003) where it is shown that OECD (Organization for Economic Cooperation and Development) has strong, robust positive effect on trade. However, this should not be the case as OECD does have the formal power to ensure trade liberalization, nor its sole purpose is trade liberalization. Second puzzle was identified in many studies such as Frankel (1997), Deardorff (1998), Anderson and Marcouiller (2002) stating that bilateral increases with the level of GDP and that high income countries trade more with all trading partners including themselves, whereas low-income countries trade less. However, there is no clear theoretical explanation for the positive correlation between GDPs per capita and aggregate trade. thus, the authors aim to contribute to the understanding of the quantitative importance of institutions on bilateral trade by testing the hypothesis that both the OECD effect and GDP per capita effect that is typically found in the gravity literature are driven by the fact that OECD countries and countries with high per capita income are in general countries with relatively good institution. Another way of saying that the OECD dummy and GDP per capita act as proxies for institutional quality and institutional homogeneity. As all the indicators are highly correlated, authors took the sum of all indicators as an overall score to measure the effectiveness of a country's institutional framework. The mean value for the combined indicator on institutional effectiveness is 0.97, whereas they took the standard deviation 5.02. The upper and lower limits are from -15 to +15. Here, they did not run the regression taking separate variables into account, rather than combined variables as

institutional quality exporter, institutional quality importer, institutional homogeneity, joint OECD membership and single OECD membership. The result shows that without institutions, OECD- membership independently raises trade and it creates more trade with non-members than fellow members. With institutional quality, it has completely upside-down robust effect, and it is statistically significantly negative. The homogeneity in the gravity model does not change the effect of either the quality of institutions or the joint membership in the OECD on trade.

Alhassan A. and Payaslioglu C. (2020) separately talk about economic institutions and political institutions. According to them, the case of Africa is different in terms of institutional dynamics and trade, and realistic explanations are required. Here, they divided the countries into two sections: emerging economics (EE) and low- income countries (LICs) as the effect may vary significantly with the level of income of the countries. Two of the main elements of this study are:

1. They considered the impact of both economic and political institutions on bilateral trade.
2. They provided a comparative analysis of institution- trade relationship by income levels of the economics.

Apart from gravity variables, they also take RTA into account. Property rights, government spending, business freedom, labour freedom, monetary freedom, investment freedom is used as economic institutional variables. By using the PPMLHDFE (Pseudo-maximum likelihood with high dimensional fixed effects) they confirm that institution affect trade more in the emerging African economics (EE) than the low-income countries (LICs). On the contrary, economic institutions have bigger influence than political institutions in the LICs, however the opposite is true for EE.

Chishti et al (2021) take the interaction effect of institutional quality and development rather than only institutional quality. They argue that institutional homogeneity is a more crucial factor than the simple quality of institutions for bilateral trade. Here, institutional quality is taken from Economic Freedom of the World (EFW) database. EFW index is divided into five sub-indices as follows: 1) size of government, 2) legal structure and protection of property rights, 3) access to sound money, 4) freedom to trade internationally, and 5) regulation of business, credit, and labor. The range for them is between 0-10, where zero is considered the worst and ten is the best quality. The second main variable of their paper is development, and they take real GDP per- Capita in US dollars, constant 2010 as proxy. The findings exhibit that institutional quality and level of development have positive effects on bilateral export, although the effects are stronger when the exporter countries are developed and have better institutions than the importer countries. That of, the condition of exporter country matters more than importer country. Furthermore, the empirical result of homogeneity of institutions explains that it enhances bilateral trade.

Alvarez et al. (2018) examine the effect of national institutional quality on bilateral sectoral trade flows. Taking the help of new trade theory framework, they derive a sectoral gravity equation including novel variables corresponding to the exporter's labour competitiveness levels, importer's price indices, sectoral incomes, and analysis industry specific bilateral trade flows of 186 countries for the period 1996-2012. They give both theoretical and empirical analysis to it. For theoretical analysis, they expand the Ricardian model of comparative advantage and divide the goods into tangible and service products. Tangible data are further divided into agriculture and raw materials. Country specific variables correspond to labour competitiveness, sectoral price indices and sectoral Gross Value Added (GVA) in the importer

country. They prove that institutional quality for both destination and origin country is important for bilateral trade. The effect is greater for agriculture and raw materials than for manufacturing and services.

Interestingly, Jansen et al. (2004) consider only three variables as institutional quality, as follows: government effectiveness, rule of law and control of corruption. They put emphasis on trade openness and take three kinds of tariffs as a tool to measure openness: bilateral tariffs, importer's average tariffs and exporter's tariffs. Other variables are quality of roads, costs of finance and information is measured by penetration of telephone, and credit to private sector relative to GDP. The result indicates that a country's level of openness depends substantially on the quality of institutions. Domestic tariffs separately do not matter for trade; however, they have a positive and significant impact when combined with good institutions. When domestic infrastructure is added in the model, the parameter of institution variables gets decreased or even insignificant.

Aziz N. et al. (2018) distinguish intra- industry trade between vertical intra-industry trade (VIIT) and horizontal intra-industry trade (HIIT). They considered all six variables for political institutions as well as economic factors comprising corporate tax rate, regional FDI flow, flexibility of exchange rate regime, size of the market, economic distance. Surprisingly, the result discovers that control of corruption and good governance both increase the vertical IIT but there is no effect on horizontal IIT.

Using indicators of institutional quality from the Economic Freedom of the World (EFW) database Doyle and Martinez-Zarzoso (2011) estimate the association between labor productivity and trade where they take openness as a measure of trade. Taking data for a panel of countries from 1980 to 2000, they find that countries with low institutional quality benefit from openness

to trade and the positive effect of trade on labor productivity is lower for countries with higher population.

Papers that solely confide into the effect of corruption on bilateral trade rather than institutional quality, Saputra P.M.A (2019) talks about the effect of corruption on developed and developing countries, from low-income countries to high income countries taking the data from 1995 to 2016 and find that corruption has insignificant effect on trade in developed countries, as well as developing countries. However, in the case of partner country's corruption level, there is an opposite effect, and it is significant on bilateral export.

Grabove O. (2021) examines if difference of corruption level between Preferential Trade Agreement (PTA) members makes the trade agreement fruitful by dividing the countries into two parts: south and north with two dimensions: intensive and extensive trade. The paper also finds out if the agreement is more effective with the importer or the exporter being more corrupt. Using gravity model of trade with panel data set from 1996 to 2017, they use 96 countries in the 'South' category and 103 countries in the 'North' category, they find that PTAs increase intensive margin trade more when importing countries are more corrupt but enhance extensive margin trade more when exporting countries are more corrupt. Moreover, results are robust for trade between South- South countries than North- North countries.



## CHAPTER 3

### ESTIMATION METHODOLOGY

#### 3.1 First Stage Regression: Gravity Equation with PPML Estimation

To analyze the institutional effect on bilateral trade, we applied the gravity model of trade which is confirmed by all other authors. Bilateral trade is based on gravity model which is inspired by Newton's equation of gravity in physics; gravity force between two bodies depends proportionately to the product of their masses, and inversely to the square of their distance. Applying the same notion into trade between two countries; we consider respective GDPs as body masses and geographical distance as the distance. In general, the gravity model considers trade between a pair of countries as an increasing function of their national incomes and a decreasing function of their geographical distance (Frankel and Rose, 2002). Other variables that play a vital role here are population size, land area, countries belonging to common colony, shared border, common language, common religion etc. We got well established empirical proof of this model. Amongst them, studies by Helpman and Krugman (1985) and Deardorff (1998) show that both new trade theories of product differentiation and the classical Heckscher- Ohlin theory of comparative advantage can provide a theoretical rationale for the gravity model of bilateral trade (de Groot et al., 2004). However, later researchers and economists, especially political economists figured out that policies and country's domestic institution has direct impact on international trade. International trade is highly influenced by good governance and better institutional quality as they help reduce the transaction cost and promote an efficient business environment. It improves bilateral trade flow between nations.

In the first stage we estimated the trade flow from exporter country  $i$  to importer country  $j$  with all the gravity factors that influence the trade; i.g bilateral trade resistance on export. Our

gravity equation is the theoretical adaptation of Anderson and Van Wincoop (2003) and Bergstrand et al. (2005) with modification as we included some other explanatory variables such as Linder's effect and OECD membership along with institutional factors. The dependent variable is bilateral export, and we regress it against RTA common language, common colony, distance, contiguity, Linder's effect, OECD, and landlocked.

Our baseline regression equation as follows:

$$X_{ijt} = \beta_0 + \beta_1 RTA_{ijt} + \beta_2 Linder_{ijt} + \beta_3 OECD * Linder_{ijt} + \beta_4 OECD_{ijt} + \beta_5 Comlang_{ij} + \beta_7 Comcol_{ij} + \beta_8 Contig_{ij} + \beta_9 Land_{ij} + \beta_{10} Ln dist_{ij} + \alpha_{i,t} + \pi_{j,t} + \mu_{ij,t} + \varepsilon_{ijt} \dots \dots \dots (1)$$

Where  $X_{ijt}$  denotes the annual value of export from country i to country j at period t,  $RTA_{ijt}$  represents the membership of regional trade agreement at time t; it takes the value of 1 if pair of countries are in  $RTA_{\{ijt\}}$ , and 0 otherwise. Next,  $Linder_{ijt}$  is for the effect of  $Linder_{\{ijt\}}$  in gravity analysis which we computed in the dataset taking the absolute difference of per capita GDP from the exporter country to the importer country. Many studies have incorporated Linder's effect in their gravity model and Baltagi et al. (2003) showed that Linder's effect may preserve the estimated coefficients from possible bias (Kitenge and Lahiri, 2021). OECD (Organization for Economic Cooperation and Development) is another dummy, with the value of 1 if both countries are in OECD in year t, or zero otherwise. De Groot et al. (2003) hypothesized and surprisingly showed in their paper that the effect of OECD-membership in the presence of institutional factors is significantly negative. Moreover, we took the interaction term of Linder and OECD. Thus, we are expecting negative signs in both OECD, and in the interaction of Linder. Common language is presented by the variable  $Comlang_{ij}$ , and it takes the value of 1 if at least one language is spoken by more than 9% of the population and zero

otherwise. When both countries speak the same language, it favors trade between them by making communication easy. The variable  $Comcol_{ij}$  denotes a dummy variable for common colonial relationship with the value of 1 if both the countries share a common colonizer after 1945 and zero otherwise. When countries share common colonizer, they tend to have similar organization and business environment, rules, and policies; overall the common factors that boost trade. Our next binary variable is  $Contig_{ij}$  which is the short form of contiguity to check if countries share border.  $Land_{ij}$  stands for landlockedness and finally  $Ln\ dist_{ij}$  represents the log of distance between the most populated cities of pair countries. Common language, common colony and contiguity are expected to have positive coefficient with the explanation that countries can trade efficiently without any language barrier if they speak the same language. Besides, transportation costs get reduced by geographical contiguity. Whereas landlockedness and distance are expected to have negative coefficient as they increase the transportation cost. Most of the countries use water transportation as a method of transport to carry large number of goods for overlong distance. Thus, landlocked countries may bear more cost while transporting their goods to the destination as it makes the arrangement complex.  $\alpha_{i,t}$ ,  $\pi_{j,t}$  and  $\mu_{ij,t}$  respectively stands for importer-time, exporter- time and pair-wise fixed effects. Furthermore, the last term  $\mathcal{E}_{ijt}$  is multilateral resistance.

As we have countless zero-value observations in bilateral trade in gravity data set, to avoid the biased estimation result we used the Poisson-Pseudo-Maximum-Likelihood (PPML) method with importer-time fixed and exporter- time fixed effects. PPLM allows zero observation in trade value, whereas linearized OLS would have omitted them. This method is suggested by Silva and Teneyro (2006) and according to them PPML gives appropriate grounds and explanation for the pattern of heteroskedasticity characteristics in trade flow.

### 3.2 Second Stage Estimation Method: OLS Regression with Institutional Quality

variable at a time. As institutional variables are highly correlated, if we take them altogether, the results will be omitted because of multicollinearity. We use OLS with country and time fixed effects.

$$y_{it} = \beta_0 + \beta_1 inst_{it} + \varepsilon_{ijt} \dots\dots\dots (2)$$

Here,  $inst_{it}$  denotes institutional quality which consists of 6 indicators.

Finally, to understand the effect of size of economy, we will include population size as our third variable.

The final stage estimation equation as follows:

$$y_{it} = \beta_0 + \beta_1 inst_{it} + \beta_2 pop_{it} + \varepsilon_{ijt} \dots\dots\dots (3)$$

Here,  $pop_{it}$  is size of population, i.g size of economy of exporter country.

## CHAPTER 4

### EMPIRICAL DATA SOURCE

We use annual bilateral trade data for 252 countries covering the period of 1996 to 2014 derived from the Centre d'études Prospectives et d'Informations Internationales (CEPII) constructed by Fouquin and Hugot (2016). Gravity variables data are also extracted from CEPII. Gravity variables such as common language, and contiguity data are constructed by Fouquin and Hugot. Regional Trade Agreement (RTA\_{ijt}) and colonial ties data were taken by Conte, M., P. Cotterlaz and T. Mayer (2022). The other two gravity variables distance and landlockedness are constructed by Mayer T., and Zignago S. (2011). Here, the variable distance is population-weighted-great-circle distance in Kilometer and landlockedness was country specific. We construct a dyadic landlockedness variable that takes the value of 1 if at least one of the trading partners is landlocked, and 0 otherwise. To make the data complete and to get accurate results, we computed intranational trade data, in another word domestic trade. According to Kitenge E. et al. (2021), we computed the domestic trade by taking the difference between total domestic production (GDP) and total export.

Institutional quality or quality of governance data are taken from the World Government Indicator (WGI) developed by Kaufmann et al. (2010). According to working paper named The Worldwide Governance Indicators Methodology and Analytical Issues by The World Bank (2010), the Worldwide Governance Indicators report on six broad dimensions of governance for over two hundred countries and territories over the period 1996-2021. The composite measures of governance are estimated with the Unobserved Components Model (UCM). It is country level yearly data in units of a standard normal distribution with mean zero and standard deviation of one and ranging from -2.5 to 2.5. Here the higher values correspond to better governance.

Besides, the data is also reported in percentile rank terms, ranging from 0 to 100 where 0 indicates lowest rank and 100 is highest rank. Again, the higher values correspond to effective governance and better institutional quality. All six indicators that we take are the average (estimate) of the data sources.

## CHAPTER 5

### EMPIRICAL RESULT AND DISCUSSION

First stage First, we checked how robust the gravity model is across multilateral time dependent and independent variables without Linder's term and institutional variables. We use the PPML method here.

We get expected results with almost all 1% significant level. The coefficient in RTA shows that if both the exporter and importer countries are under regional trade agreement, trade increases by 40.97% and it is significant with 1% significance level Surprisingly, Membership of OECD negatively influence trade and it leads to decrease the trade by 18.7%.

We get expected results with almost all 1% significant level. The coefficient in RTA shows that if both the exporter and importer countries are under regional trade agreement, trade increases by 40.97% and it is significant with 1% significance level Surprisingly, Membership of OECD negatively influence trade and it leads to decrease the trade by 18.7%. Common language, common colony and common border have significant positive impacts on trade as they lower the transportation costs. The result indicates that if partner countries speak the same language, trade increases by 25.9%. It is also proven that contiguity countries will trade 42.6% more among each other. Finally, if trading countries are related to common colonizer, trade between them grows by 46.5%. According to the World Economic Forum, (2021) an estimated 90% of the world's goods are transported by sea, landlockedness increases the cost of transportation. As per the gravity equation, distance has a negative effect on trade. Our findings say that if countries are landlocked, trade reduces to 38.4% and with 1-kilometer increases in distance, trade drops to 60.9%.

**Table 1: Descriptive statistics**

Variable	Obs	Mean	Stan.Dev.	Min	Max
X_{ijt}	617,925	9.22E+08	4.71E+10	0	9.65E+12
RTA_{ijt}	1,077,108	0.0939144	0.29171	0	1
Linder_{ijt}	568,791	9.187121	14.38128	0	175.1069
LinOECD_{ijt}	568,791	0.2321346	2.92518	0	88.84925
OECD_{ijt}	1,175,396	0.0143526	0.11894	0	1
Comlang_{ij}	734,935	0.1488526	0.355943	0	1
Contig_{ij}	734,885	0.0152269	0.122454	0	1
Comcol_{ij}	955,350	0.1212875	0.326461	0	1
Landlocked_{ij}	1,175,396	0.2680127	0.44303	0	1
Logdis_{ij}	955,350	8.791584	0.945936	0	9.901043
GDP_{it}	890,021	1.60E+11	6.88E+11	7703228	1.07E+13
POP_{it}	716,935	33427.86	128294.8	9.264	1364270
Corrupt	799,158	-0.0023838	0.9994	-1.8487	2.459118
corrup	799,158	-0.0023838	0.9994	-1.8487	2.459118
effect	794,428	-0.0050077	0.997151	-2.4451	2.426029
polsta	807,853	-0.0030607	0.997859	-3.313	1.940006
regquality	795,174	-0.0039096	0.999103	-2.5477	2.22636
ruleoflaw	821,519	-0.0026367	0.997957	-2.5909	2.124782
voice	819,788	-0.0018782	0.99907	-2.3134	1.800992



If we look at the difference between table 2 and table 3, we see that OECD is negative with 5% significance level without the Linder's effect. Surprisingly, we get significant and positive coefficient for Linder, which hypothetically should have been negative. However, the combined effect of Linder and OECD is negative which means that in the presence of Linder's effect OECD membership has no significant influence, while their interaction term with Linder indicates that OECD member countries trade less among each other with higher divergence in product quality. It reveals that the effect of OECD membership is lower when countries have larger difference in per capita GDP i.e., income and the impact of Linder's effect is lower when countries are in the membership of OECD. Thus, our study also shows that Linder's effect is negative only for trade among the OECD countries.

**Table 2: Total trade with gravity variables and regional trade agreement (PPML method)**

---

dependent variable: total trade from county  $i$  to country  $j$

	Coef.	Prob.
RTA_{ijt}	0.4097***	(0.000)
OECD_{ijt}	-0.187**	(0.027)
Comlang_{ij}	0.259***	(0.000)
Contig_{ij}	0.426***	(0.000)
Comcol_{ij}	0.466***	(0.001)
Landlocked_{ij}	-0.384***	(0.009)
Logdis_{ij}	-0.609***	(0.000)
R_square:	0.9371	
No. of obs.:	603,127	

*Notes: we apply the PPML method over the period 1996-2014. \*, \*\* and \*\*\* denote statistical significance at 10%, 5% and 1% respectively.*

Now, because our data on institutional quality is available only from 1996, our trade data is also from 1996. One possible reason to explain the discrepancy in our result is that the year happens to coincide with the completion of the Uruguay Round of GATT negotiations. The Uruguay Round for the first time brought in developing countries in GATT negotiations. This led to big expansions of inter-industry trade, which happens more in dissimilar countries. Thus, a priori, one would expect the negative Linder effect to weaken after 1996. However, the OECD countries continue to carry out intra-industry trade and one would expect the Linder effect continue to be negative for trade among OECD countries even after 1996.

**Table 3: Total trade with gravity variables and regional trade agreement (PPML method)**

dependent variable: total trade from county $i$ to country $j$		
	Coef.	Prob.
RTA_{ijt}	0.402***	(0.000)
Linder_{ijt}	0.005***	(0.001)
LinOECD_{ijt}	-0.009***	(0.003)
OECD_{ijt}		
Comlang_{ij}	0.235***	(0.001)
Contig_{ij}	0.473***	(0.000)
Comcol_{ij}	0.547***	(0.000)
Landlocked_{ij}	-0.556***	(0.000)
Logdis_{ij}	-0.599***	(0.000)
R_square	0.9411	
No. of obs	478,377	

*Notes: we apply the PPML method over the period 1996-2014. \*, \*\* and \*\*\* denote statistical significance at 10%, 5% and 1% respectively.*

In table 4, we see positive and significant effects of institutional quality on bilateral trade. It indicates that bilateral trade increases when the exporting countries have a better government system. Importer countries feel safe with the transaction as better government ensures a risk-free environment for the trading partners.

In both 4 and 5 table, corruption has a significant positive impact on bilateral trade flow. As higher value means the level of corruption is lower in the country and that the government has managed to keep the corruption level low. Table 4 shows that with 5% significant level if exporter countries control their level of corruption, trade flow will increase by 11.6% on average. With lower levels of corruption, the government ensures that the investors are secure from any fraud and bribery, and it encourages public gain. In other words, if the government has better control over the anti-corruption department, it enhances the level of trade.

**Table 4: Exporter fixed effect with institutional quality (OLS method)**

Second stage with country and time fixed effects						
dependent variable: exporter fixed effect						
independent variables:	corrup	effect	polsta	regquality	ruleoflaw	voice
C	0.116** (0.002)	0.165*** (0.000)	0.128*** (0.000)	0.242*** (0.000)	0.283*** (0.000)	-- --
R_square:	0.9788	0.9789	0.9789	0.9792	0.9786	0.9783
No. of obs.:	2,850	2,850	2,887	2,853	2,915	2,914

*Notes: we apply the PPML method over the period 1996-2014. \*, \*\* and \*\*\* denote statistical significance at 10%, 5% and 1% respectively.*

Political stability coefficient is positive and significant for bilateral trade flow. Stable government, absence of violence and terrorism provides a safe and secure environment for foreign investors to trade. With that saying, 1% increase in standard deviation of political

stability, trade flow will decrease by 12.8% on average. This result is also supported by the study of De Groot et al. (2004) on institutional determinants of trade showed positive sign of political stability indicator.

Regulatory quality has a positive and significant effect. Countries having stable and efficient framework of policy formulations promotes the development of private and public sectors. A 1% increase in regulatory quality will enhance the trade flow by 24.4%. Our result with the sign of regulatory quality indicator matches with the findings of Alvarez et al. (2015) and De Groot et al. (2004).

Surprisingly, voice and accountability do not have a significant effect on trade. The coefficient is positive, however, not significant.

**Table 5: Exporter fixed effect with institutional quality and population size (OLS method)**

Second stage with country and time fixed effects						
dependent variable: exporter fixed effect						
Independent variables:	corrup	effect	polsta	regquality	ruleoflaw	voice
C	0.111*** (0.003)	0.177*** (0.000)	0.1297*** (0.000)	0.244*** (0.000)	0.2818*** (0.000)	
LnPOP <sub>i</sub>	0.5255 (0.000)	0.5558 (0.000)	0.5843 (0.000)	0.539 (0.000)	0.569 (0.001)	0.563 (0.000)
R_square	0.979	0.979	0.979	0.979	0.9788	0.9784
No. of obs	2,850	2,850	2,887	2,853	2915	2,914

*Notes: we apply the PPML method over the period 1996-2014. \*, \*\* and \*\*\* denote statistical significance at 10%, 5% and 1% respectively.*

Coefficient of Rule of law is positive and significant with 1% significant level. It indicates that with a 1% increase in stronger law, the trade will increase by 28.3%. Additionally, the trading partners will not be able to exploit the weakness of the rule of law. Besides, it gives the right of property and proper enforcement of laws against crime and violence. Thus, violation of the law will hinder future trade.

In table 5, when we include population size in institutional equality, it gives us almost the same results. All the coefficients for the size of economy are also positive with 1% significant level which means bigger economy tends to have better government system. Besides, the developed countries that have already bigger economies do trade more internationally. Thus, countries who are rich with their economy, are also rich in their efficiency of institutions.

## CHAPTER 6

### CONCLUSION

The principal purpose of the study is to estimate the difference specifications of gravity trade model to find the institutional determinants of bilateral trade flows. Panel data of 252 countries are used from year 1996 to 2014. The study finds out that institutions have a significant role in the growth of trade. The regression result shows that the average effect of all the government indicators taken from World Governance Indicator is positive on bilateral trade flows. The stronger the government regulatory quality in exporter countries, the higher will be the trade. Poor and ineffective government systems increase the transaction costs to exchange the goods and services, hence lower trade. This explains why countries that are economically developed with organized regulatory and efficient institutional mechanisms tend to trade more and developing countries that have poor quality and incompetent institutional framework tend to trade less. OECD is negative with 5% significance level without the Linder's effect. The result is supported by de Groot et al. (2003). Surprisingly, we get significant and positive coefficient for Linder, which hypothetically should have been negative. However, the combined effect of Linder and OECD is negative which means that in the presence of Linder's effect, OECD membership has no significant influence, while their interaction term with Linder indicates that OECD member countries trade less among each other with higher divergence in product quality. Thus, our study also shows that Linder's effect is negative only for trade among the OECD countries.

## REFERENCES

1. Abreo, C., Bustillo, R., & Rodrigues, C. (2021). The role of institutional quality in the international trade of a Latin American country: evidence from Colombian export performance. *Journal of Economic Structures*. 10:24
2. Anderson, J.E., & Marcouiller, D. (2002). Insecurity and the pattern of trade: An empirical investigation. *The Review of Economics and Statistics*, 84, 342–352.
3. Anderson, J.E., Yotov, Y. V. (2002). TERMS OF TRADE AND GLOBAL EFFICIENCY EFFECTS OF FREE TRADE AGREEMENTS. *NATIONAL BUREAU OF ECONOMIC RESEARCH*.
4. Anderson, J.E., & Wincoop, V. E. (2003). Gravity with Gravitas: A Solution to the Border Puzzle. *American Economic Association*
5. Ali, M. S. B., & Mdhillat, M. (2015). Does Corruption Impede International Trade? New evidence from the EU and MENA Countries. *Journal of Economic Cooperation and Development*. 36, 4, 107-120
6. Alvarez, C. I., Barbero, J., Rodríguez-Pose, A., and Zoffío L. J. (2017). Does Institutional Quality Matter for Trade? Institutional Conditions in a Sectoral Trade Framework. *World Development* 103: 72–87.
7. Alhassan, A. & Payaslioglu, C. (2020). Institutions and bilateral trade in Africa: an application of Poisson's estimation with high- dimensional fixed effects to structural gravity model. *APPLIED ECONOMICS LETTERS*. Vol. 27. NO 16, 1357-1361.
8. Arezki, R., and Van der Ploeg, F. (2010). 'Trade Policies, Institutions and the Natural Resource Curse'. *Applied Economics Letters* 17(15):1443–51.

9. Aziz, N., Hossain, B., & Mowlah, I. (2018). Does the quality of political institution affect intra- industry trade within trade blocs? The ASEAN perspective. *APPLIED ECONOMICS*. Vol 50, NO. 33, 3560-3574.
10. Baier, S., & Bergstrand, J. (2004). Economic determinants of free trade agreements. *Journal of International Economics*, 64(1), 29–63. Baier, S. L., & Bergstrand, J. H. (2007). Do free trade agreements actually increase members' international trade? *Journal of International Economics*.
11. Baier, S. L., Yotov, Y. V., & Zylkin, T. (2016). On the widely differing effects of free trade agreements: Lessons from twenty years of trade integration. *CESifo Working Paper Series*
12. Baldwin, R., & Taglioni, D. (2006). Gravity for dummies and dummies for gravity equations. *NBER Working Paper. National Bureau of Economic Research*.
13. Baltagi, B. H., Egger, P., & Pfaffermayr, M. (2003). A generalized design for bilateral trade flow models. *Economics Letters*.
14. Bustaman, A., Indiasuti, R., Budiono, B., & Anas T. (2022). Quality of Indonesia's Domestic Institutions and Export Performance in the Era of Global Value Chains. *Journal of Economic Structures*.
15. Chishti, M.Z., Hussain, B., & Khursheed, M. A. (2021). Impact of Institutional Quality on Bilateral Exports: Exploring the role of Development. *Journal of Applied Economics and Business Studies*, Vol 5, 17-34.
16. Deardorff, A. V. (1998). Determinants of Bilateral Trade: Does Gravity Work in a Neoclassical World? *The Regionalization of the World Economy*. Chicago: University of Chicago Press



17. De Groot, H.L.F., Linders, G., Rietveld, P., & Subramanian, U. (2004). The institutional determinants of bilateral trade patterns. *KYKLOS*, Vol. 57.
18. De Groot, H.L.F., Linders, G., & Rietveld, P. (2003). Institutions, Governance, and International Trade. *INSTITUTIONAL ISSUES IN THE SUSTAINABILITY OF CROSS-BORDER TRANSPORT*.
19. Doyle, E., & Martinez-Zarzoso, I. (2011). Productivity, Trade, and Institutional Quality: A Panel Analysis. *Southern Economic Journal*. 77(3), 726-752
20. Didier, L., & Hoarau, J- F. (2021). Characterising Bilateral Trade between Sub-Saharan Africa and China: The Specific Role of Institutional Quality. *Revue d'Economie Politique*. Vol. 131, 57-88
21. Fouquin, M. & Hugot, J. (2016). Two Centuries of Bilateral Trade and Gravity Data: 1827 – 2014. Working Paper. *CEPII*.
22. Frankel, J. & Rose, A. (2002). An Estimate of the Effect of Common Currencies on Trade and Income. *Quarterly Journal of Economics*. 437–466.
23. Grabova, O. (2021). HETEROGENEOUS EFFECTS OF TRADE AGREEMENTS ON TRADE. *Dissertation Paper*
24. Helpman, E. & Krugman, P. (1985). Market Structure and Foreign Trade. *Cambridge, MA: MIT Press*.
25. Heo, Y., Kien, T. N., & Huyen, N. T.T. (2017). Institutional Quality Matters: Evidence from Trade Flows of ASEAN-6 Countries. *Asian International Studies Review*. Vol 18 No. 2: 21-37
26. Jansen, M., & Nordas, H. K. (2004). Institutions, Trade Policy, and Trade Flows. *World Trade Organization*.

27. Kaufmann, D., Kraay A., & Mastruzzi, M. (2010). The Worldwide Government Indicators: Methodology and Analytical Issues. *World Bank*.
28. Kitenge, E., & Lahiri, S. (2021). Is the Internet bringing down language-based barriers to international trade? *WILEY*.
29. Levchenko, A.A. (2004). Institutional Quality and International Trade. *International Monetary Fund*.
30. Lavellee, E. (2006). Institutional Similarity, Institutions' Quality, and International Trade. *International Economics*. pp. 27-58, No. 108
31. Mayer, T., Cotterlaz, M., & Conte, P. (2022). The CEPII Gravity Database.
32. North, D. C. (1994). Economic Performance Through Time. *The American Economic Review*. 84(3): 359-368
33. Rose A. (2005). Which International Institutions Promote International Trade? *Review of International Economics*.
34. Sheikh, M. R., Chaudhry, S. I., Gul, N., & Akhtar, M. H. (2018). Institutional Determinants of Bilateral Trade Flows: A Panel Data Analysis. *Review of Economics and Development Studies*. 4(2), 247-260
35. Saputra, P.M.A. (2019). Corruption perception and bilateral trade flows: Evidence from developed and developing countries. *Journal of International Studies*, 12(1), 65-78.
36. Tamas, A. & Miron, D. (2021). The Governance Impact on the Romanian Trade Flows. An Augmented Gravity Model. *Amfiteatru Economic*, 23(56), pp. 276-289
37. Thu, M. P. (2021). Institutional Quality and Bilateral Trade: The case of Myanmar
38. Yu, M. (2010). Trade, Democracy, and the Gravity Equation. *Journal of Development Economics*. 91: 289-300

39. Zongo, A., & Oyelami, O. L. (2021). The Impact of Institutional Quality on Intra- African Trade: Evidence from sub-Saharan African Countries. *ResearchGate*.

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