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11 March 2018

Online at <https://mpra.ub.uni-muenchen.de/85258/>

MPRA Paper No. 85258, posted 18 March 2018 05:19 UTC

The Role of Governance Quality in Increasing Intra-ASEAN Trade

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Abstract

ASEAN countries have liberalized intra-ASEAN trade over the last 20 years by establishing the ASEAN Free Trade Area (AFTA). Recently, they committed achieving the ASEAN Economic Community (AEC) with the timeline set at 2015. Policy measures are being implemented based on the AEC Blueprint agreed upon 2007. One of the several motives behind this implementation is that they thought that an expansion of intra-ASEAN trade would promote economic development of the ASEAN countries as the expansion of exports would result in output growth and the expansion imports would improve productive efficiency. In the other hand, countries have to strengthen institutions in order to promote economic and trade cooperation. This article focus on exploring the role of institutions (governance quality) in increasing exports between ASEAN countries during the period 2000-2015 using the augmented gravity model. We use data from DOTS (IMF), World Development Indicators (World Bank) and World Governance Indicators (World Bank). The result suggest that institutions of ASEAN countries, as well as the governance quality of the ASEAN countries have positive and significant effect in increasing exports between ASEAN Countries.

Key words: Trade, ASEAN, Institutions, Governance Quality, Export, Gravity model

JEL : F14, F17

1. Introduction

The main motivation from all of the trading cooperation is to improve the welfare of the people in each country. Increasing in social welfare will narrow the gap between member countries. In his study, Keefer and Knack (1997) stated that a country's ability to "catch up" is mostly determined by the institutional environment in the country's economic activity. According to the early neoclassical analysis, the developing countries will develop faster than the prosperous country, due to technological advances and diminishing returns to capital in the latter. However in the empirical reality, there are some studies that do not in line with the analysis, poor countries are falling back rather catching up. It is parallel with Deardorff statement (2001), that international

trade patterns to a large extent depend on largely unobserved trading costs, instead of factor endowments and technology. On the same note, Anderson (2001) states that informal trade barriers appear to be very large even between similar countries, such as the US and Canada. Thus, informal trade Barrie may help explain the home bias or border effect in trade.

The unobserved barriers to trade are often associated with imperfect or asymmetric information and uncertainty in exchange. This can be an important study material to explain why some developing countries are declining rather than experiencing a catching up process. One of possibilities is an institutional deficiency that causes this discrepancy (Keefer & Knack, 1997). De Groot et al. (2004) argued that the institutional framework is an important element in explaining the size of transaction costs that appear to be a trade barrier. How is economic growth affected by the institutional framework? In his paper, Aron (2000) states that it is integral to the amount of spent on both the costs on transactions and the costs of transformation (in the production process). Transaction costs, for example, are far higher when property rights or the rule of law are not reliable. In such situations private firms typically operate on a small scale, perhaps illegally in a underground economy, and may rely on bribery and corruption to facilitate operations. Transformation costs, too, can be raised substantially because unenforceable contracts mean using inexpensive technology and operating less efficiently and competitively on a short-term horizon.

North (1991) stated that institution are the humanly devised constraints that structure political, economic and social interaction. They consist of both informal constraints (sanctions, taboos, customs, traditions, and codes of conduct), and formal rules (constructions, law, property rights). Institution provide the incentive structure of an economy; as the structure evolves, it shapes the direction of economic, change towards growth, stagnation or decline. This institutional term refers to a wide range of structures in which very influential in economic output such as the execution of the contract (contract enforcement), the rules of property rights, investor protection, political system, and so on (Levchenko, 2007). The major focus of the literature on institutions and transaction costs has been on institutions as efficient solutions to problems of organization in a competitive framework (Williamson, 1985).

In conducting international trade, international transactions conducted are closely linked to various governance systems. It is acknowledged that this free trade case is very complex, and many economists agree that the government can intervene strategically to manage trade in a way that can generate greater profits in free trade (Krugman, 1987). Li and Samsell (2009) stated that

the government should pay attention to institutional conditions as an evaluation material and also take into account the trading conditions of their trading partners. In selecting trading partners, a company needs to consider the characteristics of a trading partner's perspective (such as reputation, resources and so on), partner country trade policies, and conditions of governance. The effectiveness of domestic institutions in ensuring and enforcing the rules in the economic exchange will greatly determine the cost of trade (De Groot, et al., 2004).

Anderson and Marcouiller (2002) been among the main contributors to extend institutional analysis of the economy explicitly to the field of international trade. Their most recent contribution combines the analysis of the effects of institutions in a theoretical model with empirical estimates of the impact of institutional effectiveness on trade. De Groot, et al. (2004) used a measure of governance developed by Kaufmann and Mastruzzi (2005), consisting of six indicators, voice and accountability, political stability, governance effectiveness, regulatory quality, property rights, and corruption control - and a tendency to measure quality And the effectiveness of government and its policies. Koukhartchouk and Maurel (2003) adopt measures that give more weight to economic policies that affect economic freedom (growth), not on the overall governance environment.

2. Literature Review

Gravity model of trade is an economics model that is used to predict amount of trade flow between two countries by using the amount of GDP of both countries and the distance between them. Tinbergen (1962) was the first to use econometric model based on gravity equation. The idea of this model was adapted from Newton's law of universal gravitation. Initial gravity model equation according to Newtonian law is :

$$F_{ij} = G \left(\frac{Y_i Y_j}{D_{ij}} \right)$$

Where F is a trade flow, G is a constant, Y_i is a GDP of country i, Y_j is a GDP of country j, D_{ij} is the distance between country I and country j. However, more variables can be added to the equation in order generalized and enhance precision of the model. Gravity model with more variables is called "Augmented Gravity Model".

The first theoretical foundations of the gravity equation applied to trade flows are found in Anderson (1979), Helpman and Krugman (1985), and Bergstrand (1985). More recently, the

empirical research has included various country-pair proxies in gravity equation modelling, such as geographical proxies, institutional proxies and historical and cultural proxies among others.

In his papers, Anderson (1979) derive the gravity equation of the expenditure system properties. The gravity equation is formed on the basis of production in a microeconomics where bilateral trade flows should include exporters and importers' income as exogenous variables. Bergstrand (1985) completes the theoretical foundation with more detailed explanation on the supply side and puts the price into the equation. In his paper, Bergstrand (1989) also offered an analytical framework for understanding the gravity equation that is consistent with modern theory of inter-industry and intra-industry trade. Using a two factor, two industry, N-country Heckscher-Ohlin-Chamberlin-Linder model, exporter income and per capita income could be interpreted as national output in terms of units of capital and the country's capital-labor endowment ratio, respectively. The generalized gravity equation explains empirically between 40% and 80% of the variation across countries in one digit SITC trade flows.

Ekanayake, et al. (2010), in his empirical study of RTA in Asia, stated that the real income of both exporters and importers positively affected bilateral trade. The size of the population for both countries in both countries negatively affects bilateral trade. The inter-state distance statistically has a negative and significant effect on the magnitude of exports in Asia.

By adding institutional variables, Anderson and Marcouiller (2002) use a gravity model to show that bilateral trade is significantly affected by the trading countries' institutional quality, with better institution leading to large trade volumes. Rajan and Lee (2003) demonstrates that bilateral trade volumes are more affected by institutional quality in sectors which they classify as more institutionally intensive. Jasen and Nordas (2004) found that domestic institutions have a positive and significant impact on bilateral trade flows. This study is in line with Dollar and Kraay (2002) which states that rapid growth, high trading rates and good institutional will move together.

Levchenko (2007) proposes a simple model of international trade in which institutional differences are modeled within the framework of incomplete contracts. This study show that doing so reverses many of the conclusions obtained by equating institutions with productivity. Institution differences as a source of comparative advantage imply, among other things, that the less developed country may not gain from trade and factor prices may actually diverge as a result of trade. It also test empirically whether institution act as a source of trade, using data US imports

disaggregated by country and industry. The empirical results provide evidence of “institutional content of trade”: institutional differences are an important determinant of trade flows.

Other researchers who examined institutional factors is De Groot et al. (2004). The results showed that low institutional quality increased transaction costs in trade and concluded that institutional quality had a positive and substantial impact on the trade flow. Levchenko (2007) also explained that institutional is the core of trade, institutional difference is a critical determinant of the flow of trade. The barriers of integration resulting from the low quality of economic institutions are expressed in the study of Kurcharcuva, et al (2010). His study explained that the low economic institutional quality in the countries of South Eastern Europe (SEE) and Commonwealth of Independent States (CIS) shows the greatest obstacle to greater integration. He also stated that, if the CIS countries achieve the same institutional as the EU, then the total trade will increase by 230%, while the SEE will increase by 150%.

3. Methodology

3.1. Data

To view the institutional role of trade in ASEAN, this study uses augmented gravity model by including basic variables (GDP, per capita GDP, population and distance between the two countries) as well as some additional variables that represent policy (economic integration, trade restriction) and institutional determinants of bilateral trade flows. The following is an explanation of the variables that used in this study (see Table 1 for the summary). This study uses export (X_{it}) as an approach to bilateral trade between ASEAN countries. Export from exporting country to importing countries serve as a dependent variable, that determined by number of independent variables. GDP of exporting and importing countries calculated based of Purchasing Power Parity (PPP). The size of the country’s economy is expected to have a positive effect on bilateral trade between the two countries.

Table 1 about here.

The size of population of both countries (POP_{it}) and (POP_{jt}) are approximated as a approach to the magnitude of demand in exporting and importing countries. The high demand for both countries are expected to positively and significantly effect on bilateral trade between the two countries. Geographical distance (Dist), adjacency are examples of other characteristics that we take into account for each pair countries. We also use another variables to be included in our

model as exchange rate volatility (vol) in both countries, dummy for common border (border), membership of RTA (FTA) and infrastructure variable (Infra). Infrastructure variable in both countries are expected have a positive and significant impact on bilateral trade. The better infrastructure development of a country is expected to further encourage and accelerate the economic activities of the country.

This study analyzes the data from ten ASEAN countries throughout 2000 to 2014. For gravity equation, includes Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam. In the empirical analysis that follow, we make use both country specific and bilateral data from various sources. Gross Domestic Product (GDP) for exporting and importing countries are examples of country-specific variables that we include in the analysis. We use bilateral exports as dependent variable, such that each country pair yields two observations, with each country either as exporter or importer.

3.2. Panel Data Econometric Model

From the equation of the gravity regression model and developed by incorporating institutional variables and other variables that affect the amount of exports, we will estimate an equation model as follow (Anderson JE, 1979; Kucharcukova, et al. 2010; Rose AK, 2004, De Groot, et al., 2004).

$$\begin{aligned} \ln X_{it} = & \alpha_0 + \alpha_1 \ln(GDP_ppp)_{it} + \alpha_2 \ln(GDP_ppp)_{jt} + \alpha_3 \ln(POP)_{it} + \alpha_4 \ln(POP)_{jt} + \alpha_5 Vol_{it} \\ & + \alpha_6 Vol_{jt} + \alpha_7 \ln(Dist)_{ij} + \alpha_8 Infra_i + \alpha_9 Infra_j + \alpha_{10} borders_{ij} + \alpha_{11} FTA_{ij} \\ & + \alpha_{12} Ins_{it} + \alpha_{13} Ins_{jt} + \varepsilon_{ijt} \end{aligned}$$

4. Results and Discussion

Since the main emphasis in this paper is on the effects of institutions, we take a closer look at the institutional variables. We have used the database constructed by Kaufman et al. (2002). They have constructed six indicators of perceived institutional quality. Each indicator captures some related aspects of the quality of governance. They either reflect the political process, the quality of the state apparatus and its policies, or the success of government. The indicators would be discussed in turn. (1) 'Voice and Accountability' reflects the extent to which citizens can participate in selecting government and hold it accountable for the actions taken, (2) 'Political Stability' refers to the perceived likelihoods of the government being destabilized or overthrown by unconstitutional interference or excesses of violence against persons and possessions, (3) 'Government Effectiveness' as a measure for the quality of government input, (4) 'Regulatory

Quantity' is directly focused on the quality of implemented policies, (5) 'Rule of Law' indicates the quality of the legal system, and (6) "Control of Corruption" represent the extent of 'lawless' or unfair behaviour in public-private interaction. The index has a scale between -2.5 and 2.5, with -2.5 indicate the lowest value of governance. The average development index in ASEAN countries can be seen in Figure 1 below. Singapore has the highest index mean followed by Brunei and Malaysia. Seven other ASEAN countries have a negative index mean. It can be said that institutional quality in Singapore, Brunei and Malaysia are relatively better than the seven other ASEAN countries.

Figure 1 about here.

The ASEAN was brought about the signing of the Bangkok declaration by the five countries (Indonesia, Malaysia, the Philippine, Singapore and Thailand) on August 8, 1967. It might be argued that the establishment of the ASEAN was bucked up dominantly by international political motivations rather than economic ones. There are some strong reasons for this. *First*, historically the establishment was related with the process of reconciliation –mediated by Thailand- among Malaysia, Indonesia and the Philippines over certain international disagreement, especially some territorial disputes. *Second*, the ASEAN in the beginning put more points on international political issues on its aims and purposes. By establishing the ASEAN, it was by no means the end of the intra-ASEAN disputes. Many disputes, especially territorial disputes, among ASEAN countries persist; however, all members are seriously committed to resolving their differences through peaceful means and in the spirit of mutual accommodation. *Third*, in the beginning of the ASEAN establishment meeting, the Foreign Ministers from the five members were originally and actively involved. ASEAN countries have different levels of institutional quality. Table 2 illustrates the data on institutional quality. It presents the sample means and standard deviation for each of these indicators, together with some tentative illustration of the corresponding cross-country difference in institutional quality.

Table 2 about here.

This study also analyze the effect of infrastructure condition in each ASEAN country on the amount of bilateral trade. The better infrastructure of a country is expected to further encourage and accelerate the economic activities of the country. This infrastructure variable is expected to have a positive effect on the bilateral trade between the two countries. In this study, we used the data of access to electricity to represent infrastructure variable in ASEAN countries.

From the data, we can see that Brunei, Singapore and Malaysia are the countries with the best access to electricity, reaching 100 percent. The development of electricity infrastructure in Myanmar did not show any significant change compared to the other six ASEAN countries.

Figure 2 about here.

The literature on the model of gravity provides a form of expectation that trade flow is a function of exporter and importer GDP as a driver of bilateral trade. In the model incorporated institutional variables as something interesting to note and is expected to impact on trade costs of both countries.

To further expand and see the robustness of the model, this study will estimate the model of empirical equations using two alternative estimates of regression equations. The first analysis used to estimate the regression equation is the OLS (Ordinary Least Square) method. To better use the gravity model, Anderson and Van Wincoop (2003) emphasize the importance of controlling multilateral resistance between trading partners who measure the implicit price index in the gravity model. Regular OLS may be biased if researchers ignore trade resistance especially when using panel data. To control multilateral resistance among trading partners, Rose and Wincoop (2001) recommend using fixed effects especially for trading partner pairs. However, Santos et al. (2006) suggests that if using fixed effect any bias will happen also, because at the time the data has a value of zero then will be issued (zero trade is dropped). They pointed out that zero bilateral trade flows are almost half of all country-pairs in their study. To biases caused by dropping zero values, several studies have addressed the development of econometric methodology to solve the problem. They utilized the Poisson Pseudo-Maximum-Likelihood (PPML) estimator to estimate a gravity equation that includes zero trade flows. In this study, we will employ regression estimation model with OLS and Poisson Pseudo Maximum Likelihood (PPML) model which is proposed by Silva and Tenreyo (2006) to solve the zero trade problem.

In the first specification, we regress bilateral trade on the level of gross domestic product in the exporting and importing country (See Table 3 for the OLS estimation result). The specification of the gravity model corresponds to basic new trade theory models, in which trade is positively related to market size. In accordance with other gravity model studies of bilateral trade, we find that GDP positively and significantly affects trade. This confirms theoretical expectations. Since we focus on exports rather than total bilateral trade, we can also examine whether the effect of GDP on trade differs between the country of origin and the country destination of trade flows.

The results indicate that export supply is income elastic : 1% increase in exporter GDP raises bilateral trade on average by about 2,19%, which is more elastic than importer GDP, with an estimate elasticity of 1,68%. The importance of GDP variation in accounting for the variation in trade is illustrated by the fact that a half of the variation in bilateral trade flows is explained by variation GDP.

Table 3 about here.

The second specification adds geographical distance as an explanatory variable of bilateral trade. The specification includes the relevant variables that feature in basic new economic geography models (Fujita et al., 1999). Distance serves as a proxy for the size of transportation costs and also reflects other distance related costs.

In economic rationale, distance negatively affects the intensity of trade. According to our estimates, distance has a negative and significant influence on the magnitude of bilateral exports between countries, a 1% increase in bilateral distance reduces trade about 0,2%. The result supports the importance of trade costs for explaining the patterns of trade. However, for equations with specifications 3 and 4 are not significant. It can be said that distance factor for the present is no longer relevant if used as a proxy of transport cost.

In this study, the standard gravity model also uses control variables such as country specification or characteristics that might have an impact of trade. In the third specification model, we added the amount of population from origin and partner countries as independent variable. The size of population indicates the amount of demand both of origin and export destination countries. The estimation from regression model indicated that if the amount of population in a country increase, it can decrease export in the country. This shows that the magnitude of domestic demand will reduce the value of the country's export. The high demand for export destination countries did not affect the amount of export to the country.

The addition of border variable, participation in RTA (Regional Trade Agreement), exchange rate fluctuation between two countries and infrastructure variable are shown in the specification model 4. Directly bounded countries have an average of larger exports. Countries that have the same number of RTA have lower exports than if they have different amount of RTA participation. The variable of exchange rate in the two countries and the condition of infrastructure of both countries did not show any significant effect to the amount of export.

From the four model specifications, it can be seen that the coefficient of GDP both countries show a consistent scale (robust). The impact of population variable both in two countries also have a similar scale, as well as for border variable. In addition, if the two countries are in different RTA memberships where exports will tend to be lower.

A better quality of institutional frameworks reduce uncertainty in contract implementation and general economic governance. This reduce transaction cost directly, by increasing the security of property, as well as indirectly, by increasing the level of trust in the process of economic transactions. Table 4 presents the results to a gravity model supplemented with institutional quality variables. Each specification includes an indicator for the perceived quality of country's institutional framework. These variables are relevant for each specification. It is given in the column heading. Across the board, the impact of higher perceived quality of governance on bilateral trade is positive and highly statistic significant. Because of institutional quality have a range between -2.5 to +2.5, it cannot log-linearize the relation between institution and trade. The relation need to be in the form of semi log. The effect's sizes reported are semi-elasticity (De Groot et al., 2004).

To interpret the substantive impact, indicated by these impact size, it stars from the standard deviation of these variables within the sample. The impact on trade of a difference of one standard deviation from the average of institutional quality give a good indication of average impact of variation in institutional quality on trade flows. Table 1 illustrates the sample mean and standard deviation of the indicators for institutional quality.

Table 4 about here.

Despite the distinction between indicators and according to the country's role as exporter and importer, the impact of variation in the institutional quality estimated is important. An increase in voice and accountability of one standard deviation from the mean lead to an increase of 43.6% in trade. From table 1 it is known that the mean score for voice and accountability is -0,77 with standard deviation is 0.667. For exporting countries (a semi elasticity of 0,543) the average trade increase.

$$d\ln(T_{ij}) = 0,543 \times 0,667 \text{ and then } dT_{ij}/T_{ij} = (e^{0,543 \times 0,667} - 1) = 0,436$$

Using average indicators of institutional quality, the regression equation estimates can be shown in last column. The impact of governance effectiveness on trade, can be explained that the overall increase of institutional quality by 1 standard deviation above the mean will increase bilateral

exports by 129,10% and bilateral imports by 132,79 %. The impact of governance on trade intensity is substantial. From this results indicate that trade cost associated with institutional effectiveness are seriously affecting the flow of bilateral trade. Therefore, countries have to improve the governance quality in order to increase their bilateral trade.

The impact of the development rate (GDP) on trade shows the magnitude of significant regression coefficients. This confirms the discovery of Anderson and Marcouller (2002) research. Based on the findings it can be concluded that dominant institutions can explain why rich countries trade more generally and more than each other, while poor countries trade less among themselves. From the first equation (first column) indicates that export supply is income elastic : 1% increase in exporter GDP raises bilateral trade on average by about 2,26%, which is more elastic than importer GDP, with an estimate elasticity of 1,57%. The size of the population, both in exporting and importing countries has a significant influence on the size of bilateral trade flow. The greater the population in both countries, the greater the exports between the two countries.

Table 5 about here.

The table 5 describes the estimation result using *Poisson Pseudo Maximum Likelihood* (PPML). The result of regression equation estimation with PPML, supports regression estimation by using OLS estimation, from equation with the institutional variable either partially or composite shows relatively same result. GDP variables positively and significant influence the amount of bilateral exports between countries. The GDP partner variable also positively influence the magnitude of bilateral trade. According to Tinbergen (1962) and Poyhonen (1963) GDP of the exporting country reflects the size of an economy, if GDP increases then the country will export its products and services more. The increased GDP of importing countries shows increasing economic activity, employment and income, so that people will spend more on both domestic and foreign products to improve their standard of living (Linnemann, 1966). The result of the regression equation estimate with PPML also confirmed Ekanayake's research et al (2010) which supports his theoretical model that the real GDP of both exporting and importing countries positively affects bilateral trade.

Partner country populations have a positive and significant influence on the size of bilateral trade between countries. This indicates that the larger the country's population partner the greater the market share of export destination countries. This is in contrast to the results of Ekanayake's

research et al (2010), which found that the size of population for both exporting and importing countries had negative effect on bilateral trade.

Directly bordering countries will provide greater possibilities for increasing exports between countries. Likewise, if two countries have different membership agreement, then the value of bilateral exports will tend to be smaller. From the equation above, the influence of the distance between countries on the amount of bilateral exports between the two countries, can only be seen from some equations only. The distance between the two countries negatively and significantly affected the size of the trade.

Institutional variables are important variables that affect the amount of bilateral exports between countries. All institutional indexes used in this study either partially or combined have a significant impact on the magnitude of trade between the two countries. In his study, Knack and Keefer (2015) explained that institutional affects economic activity through two paths : (1) the absence of secure property and contracts rights reduce incentives to move factors to the sectors where technological improvement increases rate of return, (2) inadequate institutions inhibit the adoption of new technologies that might increase the factor productivity. In his article Jasen and Nordas (2004), states that domestic institutions have a positive and significant impact on the flow of bilateral trade. Dollar and Kraay (2002) explain the rapid growth, improved trading rates and good institutions will move together. Lechenko (2007) also argues that institutional is at the core of trade, institutional differences are important determinants of trade flow. Groot et al (2004) stated in his writings that low institutional quality increases transaction cost in trade and concludes that institutional quality has a positive impact and substantial on the flow trade.

5. Conclusion

Recently, many research show attention to the importance of unobserved barriers to the international trade that caused by intangible factors. The institutional framework is one of important elements in explaining the size of transaction cost. This paper has tried to investigate the effect of institutions on the patterns of bilateral trade. It begins the argument that the quality of formal rules that govern economic interaction is an important determinant of the uncertainty and opportunism in market exchange. We find that institutional quality has a positive and significant impact on bilateral trade flow. A low quality of governance increases the transaction costs that are

incurred in exchange. This report support the hypothesis that institutional variation is an important determinant of informal barrier to trade.

The positive impact of GDP variables on the amount of bilateral exports between countries gives rise to an explanation of why high income countries trade disproportionately among each other, while the same does not hold for low income countries. In general, good governance reduces transaction costs for trade between high income countries, while trade between low income countries bears from high insecurity and transaction costs.

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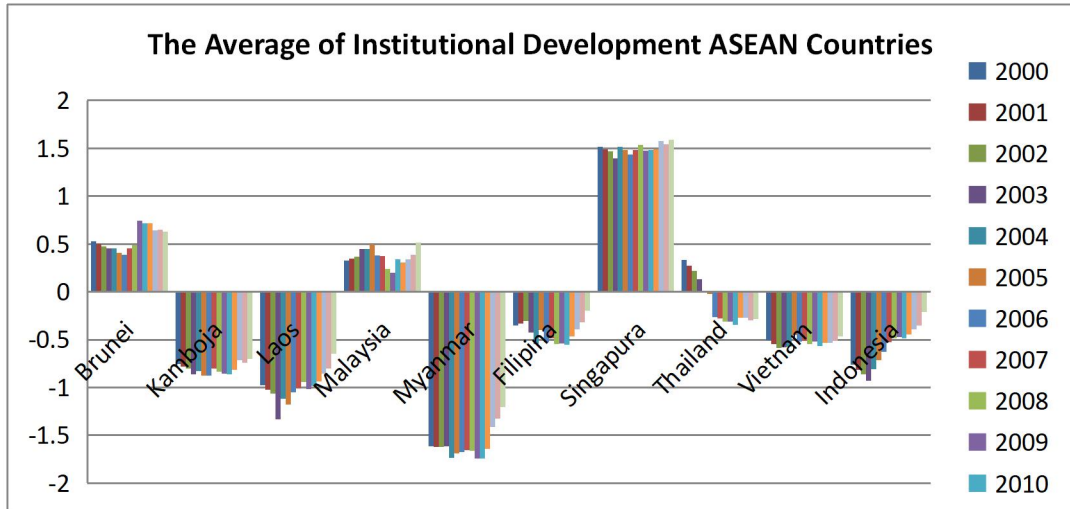
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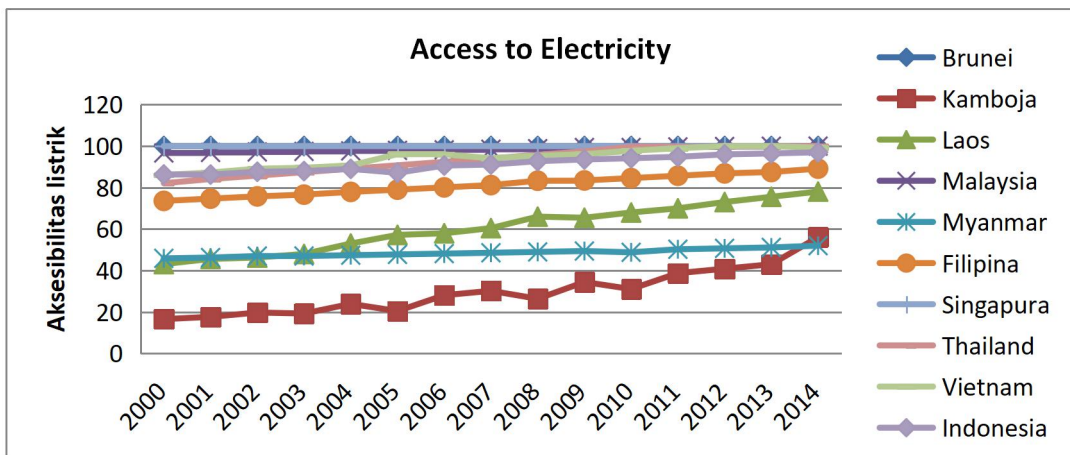
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Source:WGI, World Bank, Authors' calculation

Figure 1. The Average of Institutional Development Index in ASEAN Countries



Source:WGI, World Bank, Authors' calculation

Figure 2. Acces to Electricity in ASEAN Member Countries

Table 1. Data Description and Sources: Sample coverage - Annual 2000-2014

Group	Variable	Description	Formula	Source
Dependent Variable	Ln X_{ijt}	Log of bilateral trade (export of country i to country j) Exports- US\$ million		IMF-DOTS
Baseline model	LnGDP_p pp _{it}	LnGDP for country i, GDP in PPP, US\$ million		WDI
	LnGDP_p pp _{jt}	LnGDP for country j, GDP in PPP, US\$ million		WDI
	LnPOP _{it}	Log of population in country i, million of people		WDI
	LnPOP _{jt}	Log of population in country j, million of people		WDI
	Vol _{it}	Exchange rate fluctuation in country i		IMF
	Vol _{jt}	Exchange rate fluctuation in country j		IMF
	LnDist _{ij}	Log of bilateral distance		www.cepii.fr
Border effect	Borders _{ij}	Dummy for common border	1 if common border, 0 otherwise	Authors' calculation using World Factbook
Infrastructure	Infra _i	Access electricity in country i		WDI
	Infra _j	Access electricity in country j		WDI
Trade Policy	FTA	Dummy for FTA	1 if there is similar number of RTA agreement, 0 if different number	Author's calculation using WTO website

Institution	Ins _i	Average of WB inst. (voice and accountability, political stability, governance effectiveness, regulatory quality, property rights, corruption control) for country i	Ins _i = (ins_va+ins_pv+ins_ge+ins_rq+ins_rl+ ins_cc)/6, range from (-2,5; +2,5)	WGI, World Bank
	Ins _j	Average of WB inst. (voice and accountability, political stability, governance effectiveness, regulatory quality, property rights, corruption control) for country j	Ins _j = (ins_va+ins_pv+ins_ge+ins_rq+ins_rl+ ins_cc)/6, range from (-2,5; +2,5)	WGI, World Bank

Table 2. Some Data on Governance as Illustration : Countries at Various Level of Quality

Governance Quality	Voice and accountability	Political Stability	Government Effectiveness	Regulatory Quality	Rule of law	Control of Corruption
One s.d. above mean	Singapura	Brunei Singapura	Brunei Singapura	Brunei Singapura	Singapura	Singapura
Mean Governance	Brunei	Laos	Filipina	Filipina	-	Thailand
One s.d. below mean	Laos Myanmar Vietnam	Indonesia Myanmar Filipina	Myanmar	Laos	Myanmar	Myanmar Kamboja
Mean (sd)	-0,77 (0,667)	-0,25 (0,889)	0,05 (1,023)	-0,10 (1,023)	-0,24 (0,885)	-0,29 (1,020)

Note : All indicator scores have been scaled from -2,5 to +2,5 (see Kaufman et al. 2002)

Source: authors' calculation

Table 3. Gravity Standard Equation

Dependent Variable : Ln Export				
Result of Estimation model use OLS				
Dependent Variable	Specification 1	Specification 2	Specification 3	Specification 4
Ln(GDP_ppp) _{it}	2.186*** (0.066)	2.193*** (0.066)	2.373*** (0.084)	2.574*** (0.149)
Ln(GDP_ppp) _{jt}	1.684*** (0.065)	1.687*** (0.065)	1.794*** (0.083)	1.980*** (0.165)
Ln(Dist) _{ij}		-0.194* (0.109)	-0.168 (0.110)	-0.125 (0.111)
Ln(POP) _{it}			-0.257*** (0.073)	-0.359*** (0.096)
Ln(POP) _{jt}			-0.152** (0.074)	-0.254** (0.113)
Borders _{ij}				1.139*** (0.214)
FTA _{ij}				-0.507** (0.231)
Vol _i				-0.118 (0.160)
Vol _j				-0.261 (0.160)
Infra _i				-0.010 (0.007)
Infra _j				-0.008 (0.008)
Constant	-79.267*** (2.415)	-78.011*** (2.513)	-78.486*** (2.506)	-83.855*** (3.370)
Observations	1,350	1,350	1,350	1,350
R-squared	0.548	0.549	0.554	0.567
Standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				

Source: authors' calculation

Table 4. Extended Gravity Equation with Institutional Quality

Dependent Variable : Ln Export							
Result of Estimation model use OLS							
Independent Variable	Voice and Accountability	Political Stability	Government Effectiveness	Regulatory Quality	Rule of Law	Control of Corruption	Average of institution
Ln(GDP_ppp) _{it}	2.264*** (0.193)	2.462*** (0.145)	0.886*** (0.214)	1.027*** (0.203)	0.819*** (0.203)	1.210*** (0.199)	0.887*** (0.203)
Ln(GDP_ppp) _{jt}	1.569*** (0.218)	1.957*** (0.159)	0.302 (0.229)	0.402* (0.224)	0.256 (0.215)	0.477** (0.222)	0.192 (0.221)
Ln(POP) _{it}	-0.103 (0.111)	-0.158 (0.108)	-0.184* (0.104)	-0.145 (0.104)	-0.295*** (0.103)	-0.305*** (0.106)	-0.219** (0.103)
Ln(POP) _{jt}	-0.215* (0.111)	0.154 (0.120)	1.084*** (0.166)	1.017*** (0.160)	1.296*** (0.166)	0.923*** (0.159)	1.217*** (0.166)
Ln(Dist) _{ij}	-0.056 (0.132)	0.269** (0.129)	1.168*** (0.179)	1.148*** (0.180)	1.352*** (0.177)	1.117*** (0.179)	1.398*** (0.182)
Border _{ij}	1.078*** (0.214)	1.280*** (0.208)	1.253*** (0.201)	1.146*** (0.201)	1.341*** (0.198)	1.468*** (0.204)	1.265*** (0.199)
FTA _{ij}	-0.466** (0.230)	-0.435* (0.223)	-0.356 (0.216)	-0.302 (0.217)	-0.349 (0.213)	-0.406* (0.218)	-0.297 (0.214)
Vol _i	-0.155 (0.160)	-0.202 (0.155)	0.108 (0.151)	-0.168 (0.150)	-0.044 (0.147)	-0.128 (0.151)	-0.133 (0.148)
Vol _j	-0.290* (0.160)	-0.336** (0.155)	-0.035 (0.151)	-0.314** (0.151)	-0.197 (0.148)	-0.293* (0.151)	-0.284* (0.148)
Infra _i	-0.004 (0.008)	-0.022*** (0.007)	-0.011 (0.007)	0.003 (0.007)	-0.016** (0.007)	-0.002 (0.007)	-0.005 (0.007)
Infra _j	-0.000 (0.009)	-0.028*** (0.008)	-0.006 (0.008)	0.005 (0.008)	-0.009 (0.008)	0.007 (0.008)	-0.001 (0.008)
va	0.543** (0.219)						
vap	0.660*** (0.230)						
psa		1.168*** (0.179)					
psap		1.353*** (0.179)					
ge			2.441*** (0.241)				
gep			2.336*** (0.239)				
rq				1.995*** (0.199)			

rqp				1.984*** (0.204)			
rl					3.167*** (0.274)		
rlp					2.969*** (0.267)		
cc						1.988*** (0.206)	
ccp						1.945*** (0.207)	
Ins _{it}							2.996*** (0.274)
Ins _{jt}							3.051*** (0.277)
Constant	-71.952*** (4.622)	-94.639*** (3.451)	-48.080*** (4.072)	-54.254*** (3.854)	-48.787*** (3.831)	-56.457*** (3.795)	-50.201*** (3.826)
Observations	1,350	1,350	1,350	1,350	1,350	1,350	1,350
R-squared	0.571	0.595	0.621	0.619	0.633	0.616	0.630

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: authors' calculation

Table 5. Estimation with *Poisson Pseudo Maximum Likelihood (PPML)*

Dependent Variable : Ln Export (lnX_{it})							
Result of Estimation model use PPML							
Independent Variable	Voice and Accountability	Political Stability	Government Effectiveness	Regulatory Quality	Rule of Law	Control of Corruption	Average of Institution
Ln(GDP_ppp) _{it}	0.130*** (0.015)	0.140*** (0.012)	0.046*** (0.017)	0.052*** (0.016)	0.043*** (0.015)	0.062*** (0.016)	0.045*** (0.016)
Ln(GDP_ppp) _{jt}	0.089*** (0.014)	0.111*** (0.011)	0.011 (0.016)	0.015 (0.017)	0.009 (0.015)	0.020 (0.016)	0.004 (0.017)
Ln(POP) _{it}	-0.010 (0.008)	0.012 (0.008)	0.070*** (0.013)	0.069*** (0.013)	0.083*** (0.013)	0.063*** (0.014)	0.079*** (0.013)
Ln(POP) _{jt}	-0.001 (0.008)	0.019** (0.009)	0.075*** (0.013)	0.076*** (0.014)	0.086*** (0.013)	0.073*** (0.013)	0.090*** (0.014)
Ln(Dist) _{ij}	-0.004 (0.008)	-0.010 (0.007)	-0.011* (0.007)	-0.009 (0.007)	-0.018*** (0.007)	-0.018*** (0.007)	-0.014** (0.006)
NBorder _{ij}	0.043*** (0.015)	0.055*** (0.015)	0.056*** (0.015)	0.051*** (0.014)	0.062*** (0.014)	0.068*** (0.015)	0.057*** (0.014)
FTA _{ij}	-0.049*** (0.014)	-0.038*** (0.014)	-0.039*** (0.014)	-0.037*** (0.014)	-0.035*** (0.014)	-0.035*** (0.013)	-0.033** (0.014)
Vol _i	-0.007 (0.012)	-0.010 (0.011)	0.009 (0.012)	-0.007 (0.012)	-0.001 (0.011)	-0.006 (0.011)	-0.005 (0.012)
Vol _j	-0.014 (0.013)	-0.018 (0.013)	0.000 (0.013)	-0.016 (0.014)	-0.009 (0.013)	-0.015 (0.013)	-0.014 (0.014)
DnInfra _i	0.000 (0.001)	-0.001 (0.001)	-0.000 (0.001)	0.001 (0.001)	-0.000 (0.001)	0.000 (0.001)	0.000 (0.001)
DnInfra _j	0.000 (0.001)	-0.001** (0.001)	-0.000 (0.001)	0.001 (0.001)	-0.000 (0.001)	0.001 (0.001)	0.000 (0.001)
va	0.028** (0.014)						
vap	0.040*** (0.014)						
psa		0.066*** (0.010)					
psap		0.077*** (0.011)					
ge			0.143*** (0.017)				
gep			0.138*** (0.016)				
rq				0.125*** (0.016)			
rqp				0.123*** (0.015)			
rl					0.183*** (0.018)		
rlp					0.174*** (0.018)		
cc						0.116*** (0.017)	

ccp						0.114*** (0.013)	
Ins _{it}							0.178*** (0.020)
Ins _{jt}							0.190*** (0.019)
Constant	-2.421*** (0.319)	-3.686*** (0.306)	-0.983*** (0.302)	-1.274*** (0.316)	-1.037*** (0.284)	-1.426*** (0.291)	-1.080*** (0.298)
Observations	1,350	1,350	1,350	1,350	1,350	1,350	1,350
R-squared	0.525	0.540	0.565	0.559	0.574	0.557	0.568

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: authors' calculation