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ESSAYS ON INTERNATIONAL TRADE AND FOREIGN DIRECT INVESTMENT

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by

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This dissertation comprises three separate essays on international trade and foreign direct investment. We present the gravity model with Poisson pseudo-maximum likelihood (PPML) estimation to investigate the effect of transportation costs on trade, the effect of RTAs on intra- and extra-regional trade in developing RTAs and the role of institutions on FDI in ASEAN.

The second chapter is a review of the log of gravity model and econometric specification. PPML approach applied to the gravity model is initially suggested Silva and Tenreyro (2006). They have shown that the log-normal gravity equation suffers from three problems: the bias created by the logarithmic transformation, the failure of the homoscedasticity assumption, and the way zero values are treated. They show that the proposed PPML estimation technique being capable of solve those problems.

In the first essay, we study the effect of new measures of transport performance on international trade among 15 counties in southern and eastern Africa and on the international trade of those countries with six other regions in the world. The results indicate that a 10 percent reduction in transport costs increase trade volumes by about 10 percent. We also find that coefficients for each of seven transport performance do not differ significantly across years. Our results indicate that intra-regional trade of the SEA countries has higher sensitivity to distance and to transport performance than the worldwide trade of those countries. In addition there is no indication that the trade of landlocked SEA countries has higher sensitivity to the transport performance than the trade of coastal SEA countries.

In our second essay, we investigate the effects of RTAs on world and regional trade patterns, concentrating on data for the 12 RTAs covering 1981-2008. The effects of RTAs are captured by dummies that reflect intra-bloc trade and import extra-bloc trade and export extra-bloc trade separately. We find considerable variation in the trade effects associated with different arrangements. Also our finding indicates that the result for pooled regression and the result for individual regressions are different.

In the third essay, we investigate the impact of institutional 'quality' on bilateral FDI in ASEAN covering 1995 - 2005. We found that security of transactions and contracts and the quality of public governance have a strong relation to increase FDI inflow in ASEAN countries.

DEDICATION

MY AUNT: Yue Xiang Li (李月湘)

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Contents

List of Tables

Chapter 1

Introduction

International trade and foreign direct investment (FDI) are main factors of the driving forces for economic growth. The coefficients estimated by many of the cross-section and time-series studies for the period running 1970 through 1984 suggest that the growth of real GDP rises by about 0.2 percent points for every 1 percentage point increase in the growth rate of international trade (Van den Berg & Lewer, 2006). Analysis based on the new data set suggests that over the period the 1950 –1998 periods, countries that liberalized their trade regimes experienced average annual growth rates that were about 1.5 percentage points higher than before liberalization (Waczing & Welch, 2008).

This thesis is a collection of three separate essays on international trade and foreign direct investment. In particular, this dissertation consists of three applications of the gravity-model using the Poisson pseudo-maximum-likelihood (PPML) technique to estimate the impact of transportation costs on international trade, the trade effects of regional trade agreements (RTAs) on intra- and extra-regional trade in developing RTAs and the role of institutions on foreign direct investment in ASEAN.

In the next chapter, we conduct a review of the gravity model and econometric specification. The PPML approach applied to the gravity model was initially suggested by Silva and Tenreyro (2006). They have shown that the log-normal gravity equation suffers from three problems: the bias created by the logarithmic transformation, the failure of the homoscedasticity assumption, and the way zero values are treated. They showed that the proposed PPML estimation technique being capable of solving those problems.

In chapter three, we study the effect of new measures of transport performance on international trade among 15 counties in southern and eastern Africa and on the international trade of those countries with six other regions in the world. We find that most of the transport variables and distance have similar negative effects on trade. The results indicate that a 10 percent reduction in transport costs increases trade volumes by about 10 percent. Our results are substantially smaller in absolute terms than those found elsewhere in the literatures. We also find that coefficients for each of seven transport performance measures do not differ significantly across years. Our results indicate that intra-regional trade of the SEA countries has higher sensitivity to distance and to transport performance than the worldwide trade of those countries. Whether there is no indication that the trade of landlocked SEA countries has higher sensitivity to the transport performance than the trade of coastal SEA countries depends on the specific transport measure used. In addition, we find that estimates with country and time fixed effects performed better in terms of explained variance.

In chapter four, we investigate the effects of RTAs on world and regional trade patterns, concentrating on data for the 12 RTAs covering 1981-2008. The effects of RTAs are captured by dummies that reflect intra-bloc trade and import extra-bloc trade and export extra-bloc trade separately. Our first finding is that not all of the RTAs succeed in giving arise to intra-bloc trade creation. Some RTAs namely SAPTA, GCC, PAFTA, and WAEMU are found to have negative intra-bloc effects. Our second finding is that of these 12 RTAs in the sample, 7 show import trade diversion while most of the export extra-bloc trade dummies are not statistically significant. The third major conclusion is that three of five African RTAs in the sample have generated intra-bloc trade. Fourth, the results for the pooled regression and the results for individual regressions are different and the standard errors from the pooled regression are much smaller. Finally our results confirm that the basic variables of the gravity model show expected signs with high statistical significance.

In chapter five, we investigate the impact of institutional ‘quality’ on bilateral FDI in ASEAN covering 1995 - 2005. The detailed Institutional Profile database is used to highlight the main institutions that matter. We found that security of transactions and contracts are closely related to increase FDI inflow in ASEAN countries. This means that security of traditional property rights, law on bankruptcies, the security of transactions, the protection of intellectual property, lender guarantees: banking system (mortgages etc), existence and observance of labor legislation and measures, and labor inspectorate and labor courts—all are important institutions attracting FDI. In addition, the results indicate that good public governance has a positive relationship with FDI inflows. This category of institutions covers transparency, corruption control, efficiency of administration, and independence of the justice system. However we also find a negative relationship between some good institutions and FDI.

Chapter 2

The Log of Gravity Model

2.1 Log of Gravity Model

Economists have found that forces similar to gravity influence the volumes of international trade among countries. The gravity model of trade is based on the idea that the volume of bilateral trade is positively related to country's size as measured by income levels, and negatively related to the distance between them. Specifically, the gravity equation posits that the value of the volume of trade (which can be bilateral, imports or exports) between country i and j, T_{ij}, is (Rivera-Batiz and Oliva, 2003, section 3.6):

(1) Positively related to both countries' sizes as measured by income level Y_i and Y_j, and

(2) Negatively related to the distance D_{ij} between the trading partners, which serves as a proxy for many trade resistance factors, including transport and communication costs.

The name gravity model derives from the following formula's resemblance to Newton's law[1]

$$T_{ij} = \mathrm{A}\frac{Y_i Y_j}{D_{ij}},$$

where A is a constant, Y_i and Y_j are the income levels of countries i and j, and D_{ij} is the distance between the countries. T_{ij} is a measure of bilateral trade, such as the exports from countries i to j.

The gravity model[2] was first introduced by Tinbergen (1962). Anderson (1979) was the first attempt to provide theoretical foundations of the gravity model. Later scholars have tried to

[1] The theory of gravitational forces in physics tells us that the gravitational attraction exerted on an object by a body, such as the earth, declines with the distance between the object attracted and the center of the attracting body. Also the gravitational attraction increases with the mass of the attracting body. Furthermore, the theory tells us that gravitational force act on both bodies involved. For instance, the earth attracts the moon and the moon also attracts the earth. These considerations have been enshrined in Isaac Newton's law of universal gravitation. Newton's law states that every particle in the universe attracts every other particle with a force that is proportional to the product of their masses, and inversely proportional to the square of the distance between the particles (Rivera-Batiz & Oliva, 2003).

demonstrate that the gravity model can be derived from various trade theory models. Bergstrand (1985) developed a gravity model based on the Armington assumption of product differentiation by national origin. Bergstrand (1989) developed a gravity model with monopolistic competition. Deardorff (1998) showed that gravity equations can be derived in a very general setting that is independent of any particular trade model. Oguledo and MacPhee (1994) derived a gravity model from a linear expenditure system. Evenett and Keller (2002) examined whether the Heckscher-Ohlin theory and an increasing returns model can account for the gravity equation. Harrigan (2003) reviewed the literature on gravity and the volume of trade. Recently Helpman et al. (2008) developed a gravity model in the context of firm heterogeneity.

In its simplest form, the stochastic version of the gravity equation for trade is used in empirical studies as follows:

$$T_{ij} = \alpha_0 \, Y_i^{\alpha 1} \, Y_j^{\alpha 2} \, N_i^{\alpha 3} \, N_j^{\alpha 4} \, D_{ij}^{\alpha 5} \, \eta_{ij}, \qquad (2\text{-}1)$$

where Y_i and Y_j are two countries' GDP, N_i and N_j are two countries' population, D_{ij} is the distance between two countries, η_{ij} is an error factor and α_0, α_1, α_2, α_3, α_4 and α_5 are unknown parameters.

Taking logarithms of both sides of equation (2-1), the multiplicative form (2-1) of the basic gravity model changes to a log linear form:

$$\ln (T_{ij}) = \ln (\alpha_0) + \alpha_1 \ln (Y_i) + \alpha_2 \ln (Y_j) + \alpha_3 \ln (N_i) + \alpha_4 \ln (N_j) + \alpha_5 \ln (D_{ij}) + \ln (\eta_{ij}) \qquad (2\text{-}2)$$

Recently Anderson and van Wincoop (2003) and Feenstra (2004) showed that the traditional specification of the gravity model suffers from omitted variable bias, as it does not take into account the effect of relative prices on trade patterns. They note that bilateral trade intensity not only depends on bilateral trade costs (affected by spatial distance, language differences, trade

[2] Bergeijk and Brakman (2010) made a good review of the gravity model in international trade.

restrictions and so on), but also on weighted multilateral trade cost indices (reflecting the prices of import-competing goods in the importing country and export opportunities in the exporting country).

As shown by Anderson and van Wincoop (2003) and Feenstra (2004), a country-specific fixed-effects specification of the gravity model is in line with the theoretical concerns regarding the correct specification of the model and yields consistent parameter estimates for the variables of interest. These country-specific-fixed-effects absorb all other time-invariant factors that affect international trade volumes. In particular, when bilateral exports grow faster than GDP, the extent to which total exports grow faster than GDP is an individual country fixed effect, not a country-pair fixed effect. This suggestion is consistent with Matyas (1997) who noted that the correct econometric representation of the gravity model is in the form of a triple-index model; time fixed effect, importer fixed effect and exporter fixed effect. The time fixed effect makes it possible to monitor common business cycles or globalization trends over the whole sample.

Later, Cheng and Wall (2005) showed that a country-pair fixed effect model (FE) is preferred to a country fixed effect model (XFE). However, Cheng and Wall (2005) also showed that the differences of coefficients of both models are small. The main reason for this is that the standard errors from the XFE model are much larger.

This dissertation will follow Matyas (1997) and Anderson and van Wincoop (2003), using the form of a triple-index model.

The log-normal fixed effects specification of the basic gravity model is as follows:

$$\ln(T_{ij}) = \ln(\alpha_0) + \alpha_1 \ln(Y_i) + \alpha_2 \ln(Y_j) + \alpha_3 \ln(N_i) + \alpha_4 \ln(N_j) + \alpha_5 \ln(D_{ij}) + \gamma_i + \rho_j + t + \ln(\eta_{ij}) \quad (2\text{-}3)$$

where γ_i is the fixed effect of the importing country (importer dummy), ρ_j is the fixed effect of the exporting country (exporter dummy) and t is the time fixed effect. We will apply this

estimation procedure as well. We will use equation (2-3) with additional target variables to examine policies such as the effects of transport costs (chapter 3), regional trade agreements (RTAs) (chapter 4), and institutions (chapter 5).

2.2 Econometric Specification

2.2.1 Problems with the Specification of the Gravity model

In an influential paper, Silva and Tenreyro (2006) have focused critically on the traditional econometric approach to its estimation, raising serious concerns about bias, and showing that the extent of this bias could be large. They have shown that the log-normal gravity equation suffers from three problems: the bias created by the logarithmic transformation, the failure of the homoscedasticity assumption, and the way zero values are treated. These problems normally result in biased and inefficient estimates.

(1) The logarithmic transformation has an effect on the nature of the estimation process, since the log-normal model generates estimates of $\ln(T_{ij})$ but not of T_{ij}. Jensen's inequality implies that $E(\ln(T_{ij})) \neq \ln E(T_{ij})$, that is, the expected value of the logarithm of a random variable is different from the logarithm of its expected value.

(2) The log-normal model is based on the assumption that the error terms exhibit homoscedasticity[3].

(3) The log-normal model cannot deal with zero-valued trade flows since the logarithm of zero is undefined. By tradition, the most common ways to deal with this problem are to drop the pairs with zero trade[4] or use $T_{ij} + 1$ as the dependent variable. But zero-valued flows may be the result of rounding errors and using $T_{ij} + 1$ lacks a theoretical justification. Furthermore, the logs of $T_{ij} + 1$ are large negative numbers. Thus this approach confers unduly large weights on the

[3] In this dissertation, it is remarkable to observe that heterogeneous factors may influence bilateral trade (chapter 3 and 4) or investment (chapter 5). For instance, an exporting country would export different amounts of a certain good to two countries, even if GDP's of these two countries are identical and they have the same distance from the exporter.

[4] This approach clearly results in biased parameter estimates since the trade between two countries could be null because of their economic, culture and geographic features. As argued by Coe and Hoffmaister (1999), "omitting those observations represent a non-random screening of the data that may lead to biased or inconsistent estimates,'

adjusted zero-valued observation. Silva and Tenreyro (2006) avoid this problem by expressing the dependent variable in levels instead of logs.

Accordingly, Silva and Tenreyro (2006) propose the Poisson pseudo-maximum-likelihood (PPML) estimation technique and assess its performance using Monte Carlo simulations of the aggregated trade flows collected for 136 countries comparing OLS on $\ln(T_{ij})$, OLS on $\ln(T_{ij} + 1)$, ET-Tobit[5] on $\ln(T_{ij} + a)$ and NLS[6]. Siliverstovs and Schumacher (2009) confirm the performance of the PPML in comparison to the traditional estimation method using both the aggregated trade flows and the trade flows broken down by 25 three-digit ISIC Rev.2 industries as well as for manufacturing as a whole.

2.2.2 Poisson Estimation

We adopt the Silva and Tenreyro (2006, p47) specification in equation (14) of their paper.

$$E[T_{ij}|x_{ij}] = \mu(x_{ij}\beta) = \exp(x_{ij}\beta) = \exp[\ln(\alpha_0) + \alpha_1 \ln(Y_i) + \alpha_2 \ln(Y_j) + \alpha_3 \ln(N_i) + \alpha_4 \ln(N_j) + \alpha_5 \ln(D_{ij}) + \gamma_i + \rho_j + t] \quad (2\text{-}4)$$

Now by applying the Poisson specification to the fixed effects specification of the gravity model of trade (see Woodridge, 2002, section 19.2).

$$\Pr[T_{ij} = T|x_{ij}] = \frac{\exp[-\mu(x_i\beta)]\,[\mu(x_i\beta)]^{T_{ij}}}{T_{ij}!}, \quad T_{ij} = 0,1,\ldots \text{ where } T_{ij}! \text{ is T factorial} \quad (2\text{-}5)$$

Note that the Poisson model assumes equidispersion, the conditional variance of T_{ij} is equal to $\mu(x_{ij}\beta)$.

$$\text{Var}(T_{ij}|x_{ij}) = E[T_{ij}|x_{ij}] = \mu(x_{ij}\beta). \quad (2\text{-}6)$$

Then β can be estimated by means of maximum likelihood. The log-likelihood function is the sum of the appropriate log probabilities, interpreted as a function of β.

[5] Tobit of Eaton and Tamura (1994).
[6] Non-linear least square.

$$\text{Log L}(\beta) = \sum_{i=1}^{N} \sum_{j=1}^{N} [-\exp(x_{ij}\beta) + T_{ij}(x_{ij}\beta) - \log T_{ij}!] \quad (2\text{-}7)$$

The first order conditions of maximizing log L(β) with respect to β are given by

$$\sum_{i=1}^{N} \sum_{j=1}^{N} [T_{ij} - \exp(x_{ij}\beta)]\, x_{ij} = \sum_{i=1}^{N} \sum_{j=1}^{N} \varepsilon_{ij}\, x_{ij} = 0 \quad (2\text{-}8)$$

where $\varepsilon_{ij} = T_{ij} - \exp(x_{ij}\beta)$.

Since (2-4) implies that $E(\varepsilon_{ij}|x_{ij}) = 0$, we can interpret (2-8) as the sample moment conditions corresponding to the set of orthogonality conditions $E(\varepsilon_{ij}x_{ij}) = 0$. As a result, the estimator that maximizes (2-7) is generally consistent under condition (2-4), even if T_{ij} given x_{ij} does not have a Poisson distribution.

A pseudo-maximum-likelihood (PML) estimator based on equation (2-8) gives the same weight to all observations. Silva and Tenreyro (2006) suggest that this is because under the assumption of equation (2-6), all observations have the same information on the parameters of interest as the additional information on the curvature of the conditional mean coming from observations with large ($x_{ij}\beta$) is offset by their larger variance.

The estimator defined by equation (2-8) is numerically equal to the Poisson pseudo-maximum-likelihood (PPML) estimator. Since all that is needed for this estimator to be consistent is the correct specification of the conditional mean, that is, $\text{E}[T_{ij}|x_{ij}] = \exp(x_{ij}\beta)$. Therefore, the data do not have to be Poisson at all and the dependent variable can be zero.

In sum, the PPML version of the gravity model does not face the problems outlined in the above section. First the linking function is log-linear (T_{ij}) instead of log-log ($\ln T_{ij}$). Second, in the presence of heteroskedasticity Poisson regression estimates are consistent and more efficient than the traditional gravity estimations. Third, because of its multiplicative form the Poisson estimation provides a natural way to deal with zero-valued trade flows.

2.2.3 The implementation of the PPML estimator

This paper employs standard STATA econometric programs. The dependent variable is expressed in levels. The independent variables, except dummy variables, are used in logarithmic form. Within STATA11 (StataCorp., 2009), the PPML estimation can be executed using the following command:

$$poisson \quad T_{ij} \quad \ln(Y_i) \ \ln(Y_j) \ \ln(N_i) \ \ln(N_j) \ \ln(D_{ij}) \quad \gamma_i \ \ \rho_j \ \ t \ \ (other\ variable)_{ij} \ , robust$$

All inference is based on a White robust covariance matrix estimator.

The research in this dissertation uses the PPML estimation to investigate the effect of transportation costs on trade (chapter 3), the effect of RTAs on intra- and extra-regional trade in developing RTAs (chapter 4) and the role of institutions on FDI in ASEAN (chapter 5). In the gravity model community, since the PPML estimator by Silva and Tenreyro (2006) has been developed recently, it has not been used much compared to the traditional estimatiors. Kepaptsoglou, Karlaftis and Tsamboulas (2010) reviewed the empirical literature on gravity models analyzing the effects of FTAs on trade undertaken in the last decade (1999-2009). They find that with over 55 papers published within the last decade, there are only two papers using the PPML technique.

2.2.4 Expectation and Interpretation

Expectations for all explanatory variables would be indicated as follows. Y_i and Y_j would have positive coefficients, since the positive correlations between GDP and export country and import country are expected. Coefficient on D_{ij} would be expected to be negative, given that greater distances increase transportation costs.

N_i and N_j would possibly be positive or negative, depending on whether the dominant effect is an absorption effect or economies of scale. On one hand, a large population may certainly indicate a

big domestic market and large resource endowment, so that the bigger absorption effect of this domestic market causes less reliance on international trade transactions. In this case, a negative sign would be justified (Oguledo & MacPhee, 1994). On the other hand, a large domestic market allows the advantages of economies of scales to be fully exploited. It follows that opportunities for trade with foreign partners in a wide variety of goods will increase, and the expected sign of this coefficient would be positive (Kien & Hashimoto, 2005).

The parameter estimates on the Y_i, Y_j, N_i, N_j and D_{ij} can be interpreted as importer total income elasticity, exporter total income elasticity, importer total population elasticity, exporter total population elasticity and distance elasticity, respectively.

Suppose that $x_{ij,k}$ is a continuous explanatory variable. The impact of a marginal change in $x_{ij,k}$ upon the expected value of T_{ij} (keeping all other variables constant) is given by

$$\frac{\partial E(T_{ij}|x_{ij,k})}{\partial x_{ij,k}} = \exp(x_{ij,k}\beta)\,\beta_k \qquad (2\text{-}9)$$

which has the same sign as the coefficient β_k. Then from equation (2-4), equation (2-9) can be converted into a semi-elasticity.

$$\beta_k = \frac{\partial E(T_{ij}|x_{ij,k})}{\partial x_{ij,k}} \frac{1}{\exp(x_{ij,k}\beta)} = \frac{\partial \ln E(T_{ij}|x_{ij,k})}{\partial x_{ij,k}} \qquad (2\text{-}10)$$

For example, in equation (2-4), α_1 is that on average percentage change in T_{ij} induced by a 1% change in Y_i holding other factors constant. In fact this represents elasticity.

For a dummy variable, we can compare the conditional means of T_{ij}, given $x_{ij,k}$ =0 and given $x_{ij,k}$ = 1, keeping the other variables constant.

$$\frac{E(T_{ij}|x_{ij,k}=1,\ x_{ij}^*)}{E(T_{ij}|x_{ij,k}=0,\ x_{ij}^*)} = \exp(\beta_k), \qquad (2\text{-}11)$$

where x_{ij}^{*} denotes the vector x_{ij}, excluding its *k*-th element.

For example, assuming the parameter estimate α_k, the interpretation requires a simple transformation, [(exp(α_k)-1)*100%][7]. For example assume that α_{RTA} is the coefficient estimate of the RTA dummy variable and negative. This can be interpreted that two members trade [(exp($-\alpha_{RTA}$)-1)*100%] less than the amount they trade without the RTA.

2.3 Specification Tests

2.3.1 RESET test (Ramsey 1969)

We perform a RESET test (Ramsey, 1969) to check the adequacy of the estimated models with and without fixed country and time effects. Under the null hypothesis of no misspecification, the coefficient on the additional regressor is zero. In the case of fixed effect, the implementation is as follows:

(1) Run poisson T_{ij} on $\ln(Y_i)$ $\ln(Y_j)$ $\ln(N_i)$ $\ln(N_j)$ $\ln(D_{ij})$ $\ln(TC_{ij})$ γ_i ρ_j t $(other\ var)_{ij}$, *robust*

(2) Predict $\widehat{T_{ij}}$ and generate $\widehat{T_{ij}}^2$

(3) Run poisson T_{ij} on $\ln(Y_i)$ $\ln(Y_j)$ $\ln(N_i)$ $\ln(N_j)$ $\ln(D_{ij})$ γ_i ρ_j t $(other\ var)_{ij}$ $\widehat{T_{ij}}^2$, *robust*

(4) Test the significance of $\widehat{T_{ij}}^2$ (This is equivalent to a t-test on $\widehat{T_{ij}}^2$.)

In the case without fixed effects, we follow the above implementation by excluding γ_i ρ_j t.

[7] Halvorson and Palmquist (1980) initially showed a derivation of the formula.

2.3.2 Chow tests

We perform a Chow test to check whether coefficient sizes of a target variable are the same across time periods. Under the null hypothesis, the sizes of a regression coefficient are the same across years. For instance, years are cover from year1 to year10. The implementation is as follows:

(1) Run poisson T_{ij} on $\ln(Y_i)$ $\ln(Y_j)$ $\ln(N_i)$ $\ln(N_j)$ $\ln(D_{ij})$ $\ln(TC_{ij})$ γ_i ρ_j $(other\ var)_{ij}$ $\ln(Y_i)$*y1 $\ln(Y_j)$*y2 $\ln(N_i)$*y2 $\ln(N_j)$*y2 $\ln(D_{ij})$*y2 $\ln(TC_{ij})$*y2 γ_i*y2 ρ_j*y2 $(other\ var)_{ij}$*y2 …… $\ln(Y_i)$*y10 $\ln(Y_j)$*y10 $\ln(N_i)$*y10 $\ln(N_j)$*y10 $\ln(D_{ij})$*y10 $\ln(TC_{ij})$*y10 γ_i*y10 ρ_j*y10 $(other\ var)_{ij}$*y10 , *robust*

(2) Test the coefficient of $\ln(TC_{ij})$*y2 = $\ln(TC_{ij})$*y3 = $\ln(TC_{ij})$*y4 = $\ln(TC_{ij})$*y5 = $\ln(TC_{ij})$*y6 = $\ln(TC_{ij})$*y7 = $\ln(TC_{ij})$*y8 = $\ln(TC_{ij})$*y9 = $\ln(TC_{ij})$*y10

Chapter 3

International Trade and Transportation Costs in Southern and Eastern Africa

3.1 Introduction

Transportation costs are one of the main components of trade costs[8] and are cited as an important determinant of the volume of trade[9]. The cost of transportation in international trade can be defined as all shipping expenses of internationally traded good from origin point to destination place. Transport costs are important because they reduce the gains from trade. Radelet and Sachs (1998) showed that countries with lower transport costs have more manufactured exports and more overall economic growth than countries with higher transport costs. They found that doubling shipping cost is associated with slower annual growth by 1.5 percentage points. Limao and Venables (2001) found that an increase in international transport costs of 10 percent could reduce the volume of trade by about 20 percent.

Transport costs have become relatively more important as an impediment to international trade since trade liberalization has run its course. World Trade Organization (WTO, 2004) comments: "the effective rate of protection provided by transport cost is in many cases higher than that provided by tariffs". Hummels (2007) reviewed the literature on transportation cost and tariffs. He estimated that transport expenditures on the median good were half as much as tariff duties for U.S. imports in 1985, equal to tariff duties in 1965 and were three times higher than tariffs by 2004. A study of the World Bank (2001)[10] showed that for 168 out of 216 trading partners of the

[8] Anderson & Wincoop (2004) found that (170% is calculated from 2.7 = 1.21*1.08*1.06*1.07*1.14*1.03*1.55*) trade costs (170%) include all costs incurred in getting a good to a final user other than the marginal cost of producing the good itself, such as transportation costs (21%) (Both freight costs (11%) and transit costs (9%)), tariffs and nontariff barriers (8%), information costs barrier (6%), language barrier (7%), costs associated with the use of different currencies (14%), Security barrier (3%), and wholesale and retail distribution costs (55%). Number in the parenthesis is the tax equivalent of trade costs for industrialized countries.

[9] The empirical results, studying among several OECD countries between the late 1950s and the late 1980s, suggest that 67% of the growth of world trade can be explained by income growth, 25% by tariff-rate reductions, and 8% by transport-cost declines (Baier & Bergstrand, 2001).

[10] Data refer to 1998 from U.S. Bureau of Census.

United States, transport costs barriers outweighed tariff barriers. Note that the United States is actually a notable outlier in that it pays much less for transportation than other countries. Moreover, transport costs vary across regions. Freight costs in developing countries are on average 70 percent higher than in developed countries[11] (UNCTAD, 2003). Hummel (2007) noted that in 2000 transportation expenditures per dollar of trade for major Latin American countries were 1.5 to 2.5 times higher than for the United States.

Despite the increased recognition of the importance of transport costs in international trade, most empirical gravity trade research uses distance as a proxy for transportation costs. This is due to lack of availability of direct transport cost data. Also the negative association of distance and trade is perhaps the most remarkable correlation in the gravity model.

However, recent studies show that distance may not be a good proxy for transport costs. For instance Grossman (1998) argues that for plausible values of transport costs, the estimated coefficient on the distance variable in gravity trade equations should be considerably smaller than is typically reported. Limao and Venables (2001)[12] found that distance alone explained only 10 percent of the variation of transport costs. Kuwamori (2006)[13] indicated that using distance as the only proxy for transport costs was insufficient and underestimates the impact of distance on transport costs. Furthermore, commodity level exercises in Kuwanmori's paper (2006) shown that impact varies across commodities. Martinez-Zarzoso and Nowak-Lehmann (2007)[14] found that distance was not a good proxy for transportation costs. Clark (2007)[15] argued that trade and production activities are found to drop rapidly over the first third of the distance scale, rise over

[11] Freight costs by region (percentage of import value), 2001: World 6.1 %, Developed Countries 5.1%, Developing Countries 8.7%, Africa 12.7%, Latin America 8.6%, Asia 8.4% and Pacific 11.7% (UNCTAD, 2003).
[12] Limao and Venables (2001) estimated the transport cost equation using CIF/FOB measures calculated from the IMF's *Direction of Trade Statistics (DOT)* for the year 1990 covering 103 countries.
[13] Kuwanmori (2006) estimated the transport cost using $\frac{CIF-FOB}{FOB}$ from *Foreign Trade Statistics of the Philippines* for the period from 1991 to 1996.
[14] Martinez-Zarzoso and Nowak-Lehmann D. (2007) used data on Spanish export to Poland and Turkey in 2003.
[15] Clark (2007) investigates the relationship between distance and both the extent of trade and foreign production. He uses the data on industries which are identified through their use of the Offshore Assembly Provisions in the US tariff code.

the middle portion of the scale, reach a peak in the final third of the scale, and decline thereafter. This implies that transport costs will not always increase monotonically with distance. Thus, these studies suggest that using distance as a proxy for transport costs should be reconsidered.

The remainder of the chapter is organized as follows. A review of Africa's transport cost is presented in next section. Section 3.3 presents the specification of the gravity model for international trade. Section 3.4 describes the data. Section 3.5 presents the empirical results and section 3.6 concludes.

3.2 Review of Measurement of International Transport Costs

There is no single source of data that provides a definitive picture of bilateral costs of transport. One source of data which matches partner reports of trade is from the International Monetary Fund (IMF). This data set contains the ratios of carriage, insurance, and freight (CIF) to free on board (FOB) values. The ratio yields a difference equal to transport costs[16]. However, these data are subject to many serious problems which have been successively mentioned by scholars. For instance, the IMF data are of extremely low quality and rely on extensive imputation. Second, as aggregate data they are subject to compositional effects that mask the true time series in transport costs. Shifts in the types of good traded, or the sets of partners with whom a country trades, will affect measured costs even if the unit cost of shipping remains unchanged. These compositional effects are likely to be quite important – trade in manufactured goods has grown much more rapidly than bulk trade (agricultural and mining products) (Hummels, 2000). Third, since the FOB value is measured alongside the ship at the exporting country it excludes costs incurred by a land-locked country in transiting its neighbors (Amjadi & Yeats, 1995). Geraci and Prewo (1977) were among the first to question the usefulness of these ratios as a proxy of transportation costs.

[16] Transport and insurance charges for exports between country i and country j $=\frac{CIF_{ij}-FOB_{ij}}{FOB_{ij}}$. These ratios have been used by several authors to assess the effect of transportation costs on trade; see (Hummels & Lugovskyy, 2006). Even UNCTAD's Review of Maritime Transport relies heavily on IMF CIF/FOB ratios to calculate *ad valorem* shipping costs on a worldwide basis.

Recently Hummels and Lugovskyy (2006) directly investigated whether these data are usable. They found that the IMF CIF/FOB ratios are error-ridden in levels, and contain no useful information for time-series or cross-commodity variation. However, there are alternative sources for these ratios. For instance Martinea-Zarzoso (2005) used CIF/FOB rations obtained from the International Transport Data Base[17]. Kuwanmori (2006) used the data from Foreign Trade Statistics of the Philippines.

In addition to the IMF CIF/FOB ratios, the US import Waterborne Databank has been used by Sanchez, Hoffmann, Micco, Pizzolitto, Sgut & Wilmsmeier (2003) and Clark, Dollar and Micco (2004). Limao and Venables (2001) used shipping company quotes for the cost of transporting a standard container (40 feet) from Baltimore (USA) to 64 destinations. Martinez-Zarzoso and Suarez-Burguet (2005) used data on maritime and overland transport of the ceramic sector obtained from interviews held with Spanish logistics operators. Nowak-Lehmann, Herzer, Martinez-Zarzoso, and Vollmer (2007) created a transport cost index consisting of two components: (1) the actual distance via available sea routes (not great circle distance) between departure port and arrival port[18] and (2) A freight cost index[19]. Jacks and Pendakur (2010)[20] use data on transport cost from the United Kingdom and her trading partners. In so far as we know, however, there has been no previous information available on the transport performance among the countries of southern and eastern Africa and among those countries and other regions.

[17] Data were provided by Jan Hoffmann while he was working for the Economic Commission for Latin America and the Caribbean (ECLAC).
[18] http://www.maritimechain.com/port/port_distance.asp (Free access). This website provides data on distance in nautical miles and time taken (number of days).
[19] Found in Busse (2003). Average ocean freight and port charges per short ton of imports and exports cargo
[20] This paper has not clarified how the transport cost of the United Kingdom and her trading partners was constructed.

3.3 New Measures of Transport Performance

The new variables in this study measure several aspects of transport performance documented in a forthcoming report for the Public-Private Infrastructure Advisory Facility of the World Bank. The data are price, time and variability while estimates of the value of time and the implicit cost of variability were made using the data in a logit model of choice among transport corridors and sub-corridors. The logit model is presented in Kent and Cook (2007) and their applications to the data are described in Nathan Associates (2010). These data were also used in compound variables to formulate more comprehensive measures of transport costs discussed below.

(1) Price

Price is the average explicit charge for transporting a standard 40-foot container between major shipping points for each country and region. Price for trade of coastal countries is the sum of the explicit charges for export through the nearest major port plus the import charges for clearing the nearest port of the destination country. For landlocked countries, the price included explicit charges for land transport of containers to and from major shipping points as well as overseas shipment charges where applicable. Whenever alternative corridors or modes such as rail and truck were available, average charges were calculates using weights based on recent traffic history.

(2) Time

Time elapsed in the transport of goods is measured in hours and includes loading at the origin, transfer between modes, border crossing, en route activities such as vehicle weight controls, port processing and handling, customs procedures, and maritime shipping whenever applicable. For coastal countries transit time is calculated from shipper reports as the length of time from the point of origin through the nearest major port and clearing the port in the destination country. Transit time for landlocked countries is the weighted average of time for corridor transit by land and any applicable overseas shipments through export and import ports.

(3) Variability in transport time (varhrs and varpct)

Variability in transport time is measured by calculating the average of the absolute deviations from the mean transit time to find a measure of variability in hours (varhrs). Since this measure of variability is highly correlated with the average time, we divided variability in hours by the mean time to obtain a percentage measure of variability (varpct). For the coastal countries the variability is calculated as the time-weighted average of the deviations for both ports and shipping. For the landlocked countries the variability is based on deviations for land transportation plus overseas shipping where applicable.

(4) Transport Cost (Cost 1)

To develop more comprehensive measures of transport performance, we estimated the cost to shippers as the sum of the explicit freight charge plus an estimated value of the transit time. The cost is the price as defined above plus the transit time multiplied by $9, which is the revealed value of time from the logit model estimated for the region.

(5) Transport Cost (Cost 2)

The cost of variable transit time was estimated to be $2 per hour (Nathan Associates, 2010) and this permitted us to formulate another transport performance variable that we call Cost 2. This variable is the sum of the price, the value of time, and the product of the average variability in hours and two dollars.

(6) Hassle Index (has)

A hassle variable was created in order to see if there were negative trade effects from bureaucratic impediments. This variable quantified the paperwork and delay in the import and export process that exists in the countries at the beginning and end of each transport corridor. This variable is constructed from data in the Doing Business indices of the World Bank[21]. The number of days of import processing and the number of days for export processing for both countries from the data in the Doing Business are added together.

[21] www.doingbusiness.org/EconomyRankings/.

The data on price, time, and variability were obtained through interviews with freight forwarders in 15 countries of southern and eastern Africa: Angola, Botswana, Burundi, Democratic Republic of Congo, Ethiopia, Kenya, Malawi, Mozambique, Namibia, Rwanda, South Africa, Tanzania, Uganda, Zambia, and Zimbabwe. They were asked for averages for each corridor and sub-corridor and each transport mode between major shipping points. In some cases overland transport costs were based on listed freight rates for road or rail transport in a given year. Where price was not available for the land portion of the corridor in a given year, the price was interpolated from the data in other years. Rail price indices were also created for certain countries based on shipper reports. These observations were checked for reliability by comparing them with selected interviews of transporters and with published data from the Port Management Association of Eastern and Southern Africa (PMAESA) (2006), Giersing (2006), and the East African Community (2007). The same trade data were used to weight the price, time and variability observations for each corridor and mode when more than one was used in shipping between any two points. Freight forwarders did not distinguish among far flurry ports in the same region (say Baltimore or Long Beach in North America). Therefore, the transport performance measures for the external trade of southern and eastern Africa were reported only for trade with six regions: East Asia, Europe, Middle East, North America, South America, and South Asia. Respective ports were Hong Kong, Rotterdam (The Netherlands), Suez (Egypt), Baltimore (the U.S. state of Maryland), Santos (Brazil), Nhava Shiva (India).

Table 3-1 reports correlation matrixes for distance and six transport performance variables. We find high correlation in many pairs of variables. Therefore we test each of seven transport performance variables and distance separately.

Table 3-1: Correlation Matrix for distance and six transport performance variables

	Distance	Price	Time	Varpct	Varhrs	Cost1	Cost2	Hassle
Distance	1.0000							
Price	0.1189	1.0000						
Time	0.4679	0.6208	1.0000					
Varpct	-0.2329	0.0629	-0.0099	1.0000				
Varhrs	0.2631	0.5650	0.8523	0.4664	1.0000			
Cost1	0.7854	0.3799	0.7593	-0.1030	0.5735	1.0000		
Cost2	0.3201	0.8420	0.9264	0.1663	0.8890	0.6426	1.0000	
Hassle	-0.5835	0.1314	-0.1424	0.2575	0.0066	-0.4010	-0.0009	1.0000

Source: Authors' calculation

3.4 Gravity Model of Trade

The estimated import gravity model equation has the following form:

$$M_{ijt} = \text{f}\ (Y_{it},\ Y_{jt},\ N_{it},\ N_{jt},\ LANG_{ij},\ ADJ_{ij},\ TARIFF_{i},\ COMESA_{ij},\ EAC_{ij},\ SACU_{ij},\ SADC_{ij},\ T_{ij})$$

(3-1)

where

M_{ijt} is imports from country/region j by country/region i in year t,

Y_{jt} is gross domestic product of importer in year t,

Y_{it} is gross domestic product of exporter in year t,

N_{jt} is population size of importer in year t,

N_{it} is population size of exporter in year t,

$LANG_{ij}$ is dummy variable for common language country i and country j,

AGJ_{ij} is dummy variable for common border between country i and country j,

DIS_{ij} is distance between country i and country j,

$Tariff_{it}$ is tariff rate of importer county i in year t,

$COMESA_{ij}$, EAC_{ij}, $SACU_{ij}$, $SADC_{ij}$ are dummy variables for country i and country j that share

membership affinities in year after entry into force[22], namely Common Market for Eastern and Southern Africa (1996), East African Community (2001), Southern African Customs Union (2008), and Southern African Development Community (2005), respectively,

T_{ij} are alternative variables for transport or distance listed as follows:

varhrs_{ij} is variability in shipment time in hours,

varpct_{ij} is percent variability in shipment time,

cost1_{ij} and cost2_{ij} are cost of transport as defined above,

dist_{ij} is distance which is direct-line miles between major ports of entry,

time_{ij} is average transit time defined above,

price_{ij} is average charge for shipping a 40-foot container defined above,

has_{ij} is hassle index defined above.

We estimate various specifications of equation (3-1). We provide estimations for pooled data over 10 years and individual years, 15 SEA countries, landlocked SEA countries, and coastal SEA countries over 10 years. Since transport variables were highly correlated, we consequently entered them separately into alternative regressions.

3.5 Data

3.5.1 Import Data

We use bilateral import value into SEA countries and other six regions from Direction of Trade Statistics (DOT) – International Monetary Fund (IMF) which is our main database. Some missing IMF data are replaced by the COMTRADE. Both sources contain information in millions of nominal US dollars. The data covers the period from 1998 to 2008. The six regions consist of

[22] Year in parenthesis is the year after entry into force.

East Asia, Europe, Middle East, North America, South America and South Asia[23]. Zero import observations represent about 11 percent of the sample.

3.5.2 Data for other control variables

The data on GDP, GDP per capita, and population size are from World Economic Outlook Database – IMF. Language data are from the Wikipedia website (http://en .wikipedia.org/wiki). Information on preferential trade agreements is from the Regional Trade Agreements Information System (RTA-IS), World Trade Organization (WTO). Data for tariffs are from the United Nations TRANIS data, World Integrated Trade Solution (WITS) Database.

We report the summary statistics for all variables in table 3-2

[23] East Asia: Hong Kong; Macro; China; Japan; Korea, Dem. Rep., Korea, Rep.; Mongolia; Taiwan.
Europe: Albania, Austria, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Macedonia, Malta, Moldova, Netherlands, Norway, Poland, Portugal, Romania, Russian Federation, Serbia, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Ukraine, United Kingdom.
Middle East: Algeria; Armenia; Azerbaijan; Bahrain; Cyprus; Djibouti; Egypt; Georgia; Iran, I.R. of; Iraq; Israel; Jordan; Kazakhstan; Kuwait; Kyrgyz Republic; Lebanon; Libya; Mauritania; Morocco; Oman; Qatar; Saudi Arabia; Sudan; Syrian Arab R.; Tajikistan; Tunisia; Turkey; Turkmenistan; United Arab Emirates; Uzbekistan; Yemen, Republic of.
North America: Canada; United States; Mexico
South America: Argentina; Bolivia; Brazil; Chile; Colombia; Ecuador; Guyana; Paraguay; Peru; Suriname; Uruguay; Venezuela
South Asia: Afghanistan; Bangladesh; India; Maldives; Nepal; Pakistan; Sri Lanka

Table 3-2: Summary Statistics

Definition	Mean	Std. Dev.	Min	Max
Imports in millions of $US.	7,383.944	42,338.66	0	64,9428.4
Importer Population (millions)	246.0452	438.7541	1.572	1,585.24
Importer GDP of $US (billions)	1,799.979	4,105.308	0.595	21,414.7
Exporter Population (millions)	246.5163	438.5485	1.572	1,585.24
Exporter GDP of $US (billions)	1,799.324	4,105.592	0.595	21,414.7
Language	0.485714	0.49985	0	1
Adjacency	0.152381	0.35943	0	1
Importer's Tariff	12.47622	6.05182	2.7291	41
Importer Landlocked	0.42857	0.49492	0	1
COMESA	0.17143	0.37692	0	1
EAC	0.01039	0.10141	0	1
SACU	0.00519	0.07189	0	1
SADC	0.14026	0.34729	0	1
Distance in direct-line b/w ports (Miles)	3,134.043	2,366.254	110	11,220
Price of shipping 40-foot container in $US	7,045.395	4,730.321	284	23,539
Time in transit (hours)	882.2415	656.9624	24	2961
Variability as percent of mean time	222.6821	79.37049	40	864
Variability of transit time in hours	1,957.677	1,755.647	58	10,058
Transp.Cost1 incl.time is $US	34,478.58	28,340.17	770	124,203
Transp.Cost2 incl.time and variability	17,136.44	11,364.78	926	51,877
Hassle Index	141.5667	46.24092	25	250
Number of Observation	4620			

Source: Authors' calculation

3.6 Results

We check the adequacy of the estimated models with and without fixed country and time effects by performing a RESET test (Ramsey, 1969). We report the regressions with fixed effects in table 3-3 and without fixed effects in appendix A3-1. The p-values of RESET tests are reported at the bottom of each table. We find that regressions with fixed effects performed better in terms of explained variance. In five of eight cases without fixed effects, the test rejects the hypothesis that the coefficient on the test variable is 0.00. This means that the model estimated without fixed effects is inappropriate. In the fixed effect regression, only two cases are rejected by a RESET test. However the coefficients of transport performance variables are not different from one another. This study follows the results from the estimated models with fixed country and time effects.

Overall the model explains a high proportion – higher than 90 percent – of the total variation of imports. Most of the basic-gravity-model-variables are significant with expected signs namely importer's population, importer's GDP, exporter's GDP, common language. RTA variable is significant and positive, only EAC while SACU is significant and negative implying that EAC and SACU agreement seems to have increased and decreased trade among its members, respectively. The effects of the landlocked dummy were associated with higher trade.

We find that most of the transport variables and distance have similar negative effects on trade. Six of eight transport performances are significant and negative namely distance, transport price, transport time, variability in transport time in hours, cost1 and cost2. In the case of percentage variability in transport time, the result indicates is positive, not significant and misspecification in both regressions with and without fixed effect.

The coefficients of the transport variables, which are elasticities, are -1.045, -0.630, -1.027, -0.377, -1.063, and -0.965, respectively. Of six significant transport variables, cost2 is the most comprehensive measure of transport performance among the new estimates used for this study

and it has highly significant expected negative effects on trade flows. The coefficient on cost2 is -1.063 suggesting that a 10.00 percent decrease in cost2 is associated with a 10.63 percent increase in trade. The effects of distance and some of the transport performance variables are very similar namely transport time, cost1 and cost2 which are around 1.00 in absolute terms. In comparison with other studies, Martinez-Zarzoso and Nowak-Lehmann D. (2007) surveyed the literature[24] and concluded that "a 10 percent reduction in transport costs increases trade volumes by more than 20 percent." Their results are substantially larger in absolute terms than those found in the present study.

There are two possible explanations for the difference between our results and others. The first is that the PPML estimator reduces the size of our transport coefficients. According to Silva and Tenreyro (2006), the traditional estimator for the gravity model exaggerates the size of the coefficients. The second involves measurement of the value of transport costs. As described above in section 3-2, most previous studies used CIF/FOB ratios as a proxy for transport costs. In sum our pooled sample between SEA countries and six regions over 1998 – 2008 strongly confirms the importance of transport variables. We find the elasticity of trade flows with respect to transport costs of about -1.00.

In the case of hassle index, the results indicate positive effect in both regression with and without fixed effect and the p-values of RESET tests show that regressions without fixed effects performed better.

[24] (Limao & Venables, 2001); (Micco & Perez, 2002); (Clark, Dollar, & Micco, 2004); (Egger, 2005); (Combes & Lafourcade, 2005); (Martinez-Zarzoso & Suarez-Burguet, 2005)

Table 3-3: Gravity model regression with measures of transport performance (Panel 1999-2008)

	Distance	Transport price	Transport time	Variability in percent	Variability in hours	Cost 1	Cost 2	Hassle Index
Importer's Population	1.269 (0.820)	1.224 (0.677)	2.738*** (0.741)	2.365** (0.740)	3.014*** (0.726)	2.548*** (0.730)	2.314*** (0.688)	1.056 (0.976)
Importer's GDP	0.697*** (0.183)	0.381** (0.124)	0.269* (0.131)	0.265 (0.142)	0.228 (0.128)	0.273* (0.130)	0.287* (0.121)	0.728*** (0.220)
Exporter's Population	1.527* (0.665)	0.0329 (0.784)	0.768 (0.787)	0.738 (0.803)	1.027 (0.790)	0.572 (0.765)	0.399 (0.750)	1.401 (1.003)
Exporter's GDP	0.447** (0.151)	0.697*** (0.161)	0.603*** (0.172)	0.596*** (0.166)	0.563*** (0.161)	0.622*** (0.173)	0.628*** (0.160)	0.479** (0.182)
Language	0.237*** (0.0579)	-0.0782 (0.146)	-0.664*** (0.163)	-0.434** (0.157)	-0.308* (0.149)	-0.464** (0.163)	-0.233 (0.145)	0.431*** (0.0715)
Adjacency	-0.850*** (0.143)	1.977*** (0.179)	1.486*** (0.158)	2.315*** (0.174)	1.883*** (0.172)	1.769*** (0.167)	1.721*** (0.165)	0.408*** (0.110)
Importer's Tariff	0.00511 (0.0427)	0.00413 (0.0521)	0.0127 (0.0579)	0.00452 (0.0578)	0.00728 (0.0549)	0.00918 (0.0578)	0.0114 (0.0531)	0.0216 (0.0637)
Importer Landlocked	2.149* (0.917)	1.618* (0.718)	2.321** (0.795)	2.366** (0.782)	2.776*** (0.775)	2.573*** (0.771)	2.264** (0.735)	1.481 (1.065)
COMESA	0.629** (0.202)	-0.125 (0.219)	-0.376* (0.189)	-0.519 (0.277)	-0.508* (0.229)	-0.396* (0.192)	-0.382* (0.187)	0.626* (0.250)
EAC	2.889*** (0.261)	1.623*** (0.287)	1.133*** (0.260)	1.710*** (0.336)	1.561*** (0.285)	1.493*** (0.261)	1.513*** (0.258)	4.405*** (0.296)
SACU	-5.619*** (0.623)	-6.168*** (0.287)	-6.162*** (0.542)	-6.168*** (0.544)	-6.027*** (0.547)	-6.036*** (0.546)	-6.065*** (0.555)	-5.029*** (0.577)
SADC	1.304*** (0.191)	-0.030 (0.172)	-0.0722 (0.147)	0.0486 (0.168)	0.0229 (0.157)	-0.0141 (0.162)	-0.0413 (0.162)	3.195*** (0.182)
Distance	-1.045*** (0.0755)							
Transport Price		-0.630*** (0.072)						
Transport Time			-1.027*** (0.0871)					
Variability in percent				0.0657 (0.0675)				
Variability in hours					-0.377*** (0.0696)			
Cost 1						-1.063*** (0.0995)		
Cost 2							-0.965*** (0.0938)	
Hassle Index								0.587* (0.257)
Constant	-2.223 (3.618)	0.639 (3.329)	-4.884 (3.211)	-10.27** (3.296)	-9.829** (3.298)	-0.407 (3.322)	0.123 (3.262)	-13.85** (4.992)
Number of Obs.	4620	3900	3900	3900	3900	3900	3900	3900
Pseudo R-sq	0.986	0.930	0.935	0.925	0.928	0.933	0.933	0.981
RESET test p-values	0.5175	0.1069	0.0168	0.0001	0.4726	0.2207	0.2608	0.0004
IMPORTER – FIXED EFFECT, EXPORTER – FIXED EFFECT and TIME FIXED EFFECT								

Standard errors in parentheses *p<0.05, **p<0.01 and ***p<0.001

We ran each of seven transport performance variables for each year. Overall, the cross-section regressions coefficients of transport performance in each year do not differ from the pooled estimation. The coefficients of transport performance that are significant with the expected sign in the pooled regression remain significant with the expected sign in the cross-section regressions. We tested each transport performance variable to see whether trade follows the same size of a regression coefficient for each year (1999 – 2008). We found that coefficients for each of seven transport performance variables do not differ across years in Chow tests (Table 3-4). We present the regression results for each of seven transport performance variables for each year in the appendix.

Table 3-4: Chow Test for Each Transport Performance whether trade follow the same size of a regression coefficient for each year (1999 – 2008)

Variable	The Null Hypothesis: Import value follows that same size of a regression coefficient across years (1999-2008)			
	Chi2	Prob > Chi2	Interpretation	
ln_price	3.71	0.9294	Fail to reject the null H.	Do not differ significantly
ln_time	5.22	0.8143	Fail to reject the null H.	Do not differ significantly
ln_varpct	2.33	0.9851	Fail to reject the null H.	Do not differ significantly
ln_varhrs	5.95	0.7452	Fail to reject the null H.	Do not differ significantly
ln_cost1	4.26	0.8933	Fail to reject the null H.	Do not differ significantly
ln_cost2	6.72	0.5669	Fail to reject the null H.	Do not differ significantly
ln_hassle	0.77	0.9998	Fail to reject the null H.	Do not differ significantly

Source: Authors' calculation

In order to see if intra regional trade is affected more by distance and other transport variables, the regressions were reported for bilateral trade among only the countries of SEA. In every regression in table 3-5, transport performance variables are significant and negative, with the exception of the hassle index. In comparison of the results with the worldwide regressions, we find that on average coefficients of the intra-SEA regressions are higher than ones of the whole sample. This implies that intra trade of the SEA countries has higher sensitivity to distance and to transport performance.

Table 3-5: Gravity model regression with measures of transport performance (SEA 1999-2008)

	Distance	Transport price	Transport time	Variability in percent	Variability in hours	Cost 1	Cost 2	Hassle Index
Importer's Population	-3.611** (1.275)	-1.907 (1.378)	-3.184* (1.368)	-2.544 (1.337)	-3.343* (1.370)	-2.207 (1.362)	-2.308 (1.357)	-2.614* (1.273)
Importer's GDP	0.619*** (0.152)	0.434* (0.172)	0.531*** (0.156)	0.431** (0.163)	0.551*** (0.154)	0.477** (0.167)	0.490** (0.165)	0.472** (0.172)
Exporter's Population	6.775** (2.120)	7.579** (2.437)	6.941** (2.403)	7.393** (2.516)	6.715** (2.404)	7.383** (2.415)	7.285** (2.409)	6.737** (2.277)
Exporter's GDP	0.573* (0.272)	0.544 (0.283)	0.525* (0.263)	0.504 (0.300)	0.529* (0.261)	0.546* (0.275)	0.548* (0.273)	0.580* (0.295)
Language	-2.739*** (0.390)	-1.129*** (0.244)	-1.367*** (0.200)	-1.525*** (0.291)	-1.266*** (0.204)	-1.100*** (0.227)	-1.072*** (0.227)	-1.697*** (0.269)
Adjacency	0.327* (0.134)	1.039*** (0.135)	0.940*** (0.126)	0.940*** (0.107)	0.788*** (0.122)	1.064*** (0.126)	1.053*** (0.125)	1.177*** (0.137)
Importer's Tariff	0.204* (0.0999)	0.266** (0.103)	0.219* (0.0987)	0.231* (0.0995)	0.207* (0.0971)	0.258* (0.102)	0.254* (0.102)	0.218* (0.105)
Importer Landlocked	-3.577** (1.386)	-1.143 (1.459)	-4.654** (1.536)	-1.446 (1.447)	-4.370** (1.518)	-1.992 (1.461)	-2.144 (1.458)	-2.930 (1.971)
COMESA	-1.322*** (0.228)	0.169 (0.277)	-0.0257 (0.252)	0.395 (0.211)	0.351 (0.257)	0.0578 (0.260)	0.0826 (0.259)	-0.0908 (0.223)
EAC	0.958*** (0.230)	1.986*** (0.250)	1.214*** (0.229)	2.663*** (0.282)	1.513*** (0.241)	1.763*** (0.238)	1.755*** (0.237)	2.189*** (0.244)
SACU	-4.456*** (0.621)	-3.938*** (0.552)	-3.970*** (0.502)	-4.075*** (0.546)	-4.027*** (0.485)	-3.864*** (0.545)	-3.848*** (0.543)	-3.999*** (0.555)
SADC	0.173 (0.137)	0.308 (0.163)	0.0198 (0.144)	0.213 (0.149)	-0.0294 (0.141)	0.220 (0.160)	0.192 (0.159)	0.394* (0.159)
Distance	-1.429*** (0.124)							
Transport Price		-0.574*** (0.112)						
Transport Time			-1.259*** (0.139)					
Variability in percent				-2.331*** (0.345)				
Variability in hours					-1.205*** (0.121)			
Cost 1						-0.891*** (0.132)		
Cost 2							-0.938*** (0.128)	
Hassle Index								2.115 (2.966)
Constant	9.178 (5.667)	-6.812 (7.374)	2.121 (6.447)	4.807 (7.862)	3.809 (6.401)	-2.270 (7.095)	-1.204 (7.018)	-17.30 (15.07)
Number of Obs.	2310	2100	2100	2100	2100	2100	2100	2310
Pseudo R-sq	0.901	0.893	0.904	0.893	0.907	0.897	0.899	0.882
IMPORTER – FIXED EFFECT, EXPORTER – FIXED EFFECT and TIME FIXED EFFECT								

Standard errors in parentheses *p<0.05, **p<0.01 and ***p<0.001

In addition, the coefficients of basic gravity-model variables in the intra-SEA regressions remain the same as the worldwide regressions. The effects of the landlocked dummy became associated with lower trade in the intra-SEA regressions. This implies that being a landlocked of SEA country creates an obstacle to SEA intra-trade.

Next we divided the SEA sample into the landlocked SEA countries and the coastal SEA countries and dropped the landlocked dummy. At first glance, we found that five of eight transport performance coefficients for the landlocked SEA countries are higher in absolute terms than the coefficients for the coastal SEA countries. These results imply that the trade of the landlocked SEA countries has higher sensitivity to distance, to transport time, to variability in percent, to variability in hours, and to the hassle index than the trade of the coastal SEA countries (Table 3-6 and Table 3-7). For instance the coefficient of variability as percent of mean time is -1.577 for landlocked SEA countries and -1.237 for coastal SEA countries. This result means that the trade of the landlocked SEA countries is thirty percent more sensitive to variability as percent of mean time than the trade of the coastal SEA countries.

There are three cases, however where the transport performance has a greater effect on trade of the coastal SEA countries, namely price, cost 1 and cost 2. Given that the last two variables are more comprehensive measures of transport performance, the results imply that the coastal SEA countries have higher elasticities. Perhaps this is due to the availability of more transport alternatives.

Therefore, there is no indication that the trade of landlocked SEA countries has higher sensitivity to the transport performance than the trade of coastal SEA countries. It should be noted that even though the elasticities are less in some measures, there is a substantial effect on landlocked SEA countries because their transport costs are much larger.

Table 3-6: Gravity model regression with measures of transport performance (landlocked SEA 1999-2008)

	Distance	Transport price	Transport time	Variability in percent	Variability in hours	Cost 1	Cost 2	Hassle Index
Importer's Population	-2.286 (1.536)	-0.720 (1.700)	-1.445 (1.701)	-1.003 (1.682)	-1.532 (1.708)	-0.768 (1.698)	-0.807 (1.697)	-1.509 (1.496)
Importer's GDP	0.731*** (0.184)	0.494* (0.210)	0.534** (0.195)	0.485* (0.200)	0.541** (0.191)	0.527* (0.205)	0.535** (0.204)	0.605** (0.211)
Exporter's Population	6.556* (2.739)	7.153* (3.427)	6.578 (3.417)	7.085* (3.583)	6.523 (3.470)	6.785* (3.415)	6.697* (3.413)	7.186* (2.935)
Exporter's GDP	0.201 (0.252)	0.107 (0.291)	0.109 (0.298)	0.0726 (0.276)	0.103 (0.289)	0.123 (0.297)	0.127 (0.298)	0.258 (0.275)
Language	-0.470** (0.173)	-0.544 (0.321)	-0.207 (0.233)	-0.602* (0.285)	-0.212 (0.234)	-0.121 (0.286)	-0.0557 (0.276)	-1.043*** (0.306)
Adjacency	-0.0293 (0.140)	1.263*** (0.148)	0.912*** (0.147)	1.176*** (0.114)	0.781*** (0.143)	1.191*** (0.150)	1.167*** (0.150)	1.234*** (0.142)
Importer's Tariff	0.0941 (0.135)	0.324* (0.153)	0.228 (0.143)	0.306* (0.145)	0.213 (0.142)	0.303* (0.150)	0.296* (0.149)	0.222 (0.150)
COMESA	-1.631*** (0.270)	0.381 (0.290)	0.200 (0.266)	0.690*** (0.208)	0.536 (0.276)	0.267 (0.284)	0.279 (0.283)	0.0875 (0.233)
EAC	0.343 (0.258)	1.627*** (0.334)	0.309 (0.322)	1.923*** (0.290)	0.267 (0.299)	1.036** (0.347)	0.889* (0.351)	1.797*** (0.284)
SACU								
SADC	-0.198 (0.157)	0.161 (0.199)	-0.0838 (0.177)	0.109 (0.191)	-0.115 (0.175)	0.755 (0.193)	0.0536 (0.191)	0.253 (0.205)
Distance	-2.125*** (0.160)							
Transport Price		-0.273** (0.105)						
Transport Time			-1.038*** (0.136)					
Variability in percent				-1.577** (0.550)				
Variability in hours					-1.071*** (0.117)			
Cost 1						-0.710*** (0.131)		
Cost 2							-0.796*** (0.137)	
Hassle Index								-15.48*** (3.860)
Constant	6.500 (5.837)	-12.61 (8.230)	-7.305 (7.404)	-4.648 (10.40)	-5.670 (7.469)	-8.583 (8.035)	-7.610 (7.972)	73.86*** (20.24)
Number of Obs.	1386	1260	1260	1260	1260	1260	1260	1386
Pseudo R-sq	0.933	0.906	0.917	0.908	0.918	0.910	0.911	0.905
IMPORTER – FIXED EFFECT, EXPORTER – FIXED EFFECT and TIME FIXED EFFECT								

Standard errors in parentheses *p<0.05, **p<0.01 and ***p<0.001

Table 3-7: Gravity model regression with measures of transport performance (Coastal SEA 1999-2008)

	Distance	Transport price	Transport time	Variability in percent	Variability in hours	Cost 1	Cost 2	Hassle Index
Importer's Population	-11.67*** (3.001)	-11.03*** (3.073)	-11.03*** (3.073)	-10.63*** (3.028)	-10.95*** (3.063)	-10.75*** (3.029)	-10.77*** (3.030)	-11.62*** (3.012)
Importer's GDP	0.547** (0.184)	0.511** (0.196)	0.511** (0.196)	0.461* (0.197)	0.507** (0.195)	0.486* (0.192)	0.490* (0.192)	0.534** (0.182)
Exporter's Population	0.140 (2.290)	1.229 (2.377)	1.229 (2.377)	1.476 (2.367)	1.172 (2.379)	1.841 (2.338)	1.750 (2.345)	0.178 (2.299)
Exporter's GDP	1.086*** (0.258)	0.999*** (0.261)	0.999*** (0.261)	0.987*** (0.257)	1.000*** (0.258)	0.974*** (0.255)	0.978*** (0.255)	1.092*** (0.259)
Language	-1.354*** (0.299)	-0.887** (0.271)	-1.244*** (0.266)	-1.067*** (0.260)	-1.148*** (0.264)	-1.047*** (0.265)	-1.036*** (0.264)	-1.206*** (0.262)
Adjacency	0.996*** (0.204)	0.975*** (0.167)	0.951*** (0.165)	1.131*** (0.179)	0.926*** (0.159)	0.907*** (0.162)	0.907*** (0.159)	1.211*** (0.198)
Importer's Tariff	0.0786 (0.112)	0.0987 (0.112)	0.100 (0.114)	0.101 (0.113)	0.0989 (0.113)	0.098*** (0.113)	0.0975 (0.112)	0.0774 (0.112)
COMESA	-0.806* (0.346)	0.145 (0.267)	0.142 (0.300)	-0.0862 (0.243)	0.283 (0.292)	0.182 (0.273)	0.213 (0.272)	-0.172 (0.255)
EAC	3.063*** (0.473)	3.396*** (0.367)	3.260*** (0.406)	3.944*** (0.376)	3.461*** (0.389)	3.320*** (0.378)	3.362*** (0.377)	3.873*** (0.348)
SACU	-3.498*** (0.714)	-3.631*** (0.740)	-3.783*** (0.727)	-3.724*** (0.797)	-3.830*** (0.748)	-3.693*** (0.742)	-3.721*** (0.749)	-3.581*** (0.756)
SADC	-0.306* (0.142)	-0.315* (0.143)	-0.406** (0.152)	-0.323* (0.148)	-0.398** (0.151)	-0.362* (0.147)	-0.370* (0.147)	-0.271 (0.139)
Distance	-0.529* (0.243)							
Transport Price		-1.076*** (0.187)						
Transport Time			-0.990*** (0.177)					
Variability in percent				-1.237*** (0.429)				
Variability in hours					-0.868*** (0.157)			
Cost 1						-1.267*** (0.203)		
Cost 2							-1.242*** (0.197)	
Hassle Index								10.16** (3.250)
Constant	44.37*** (12.65)	42.77** (13.22)	43.32** (13.30)	42.77** (13.46)	43.18** (13.27)	46.51*** (13.30)	46.71*** (13.29)	-12.98 (20.48)
Number of Obs.	924	840	840	840	840	840	840	924
Pseudo R-sq	0.940	0.946	0.945	0.944	0.945	0.946	0.946	0.941
IMPORTER – FIXED EFFECT, EXPORTER – FIXED EFFECT and TIME FIXED EFFECT								

Standard errors in parentheses *p<0.05, **p<0.01 and ***p<0.001

3.7 Conclusion

This chapter studies the effect of new measures of transport performance on international trade among 15 counties in southern and eastern Africa and on the international trade of those countries with six other regions in the world. The RESET test indicates estimates with country and time fixed effects performed better in terms of explained variance. We find that most of the transport variables and distance have similar negative effects on trade. The results indicate that a 10 percent reduction in transport costs increases trade volumes by about 10 percent. Our results are substantially smaller in absolute terms to those found elsewhere in the literatures. We also find that coefficients for each of seven transport performance measures do not differ significantly across years

The PPML estimator indicates that intra-regional trade of the SEA countries has higher sensitivity to distance and to transport performance than the worldwide trade. In addition we find that that being landlocked of SEA countries show an obstacle to SEA intra-trade but there is no indication that the trade of landlocked SEA countries has higher sensitivity to the transport performance than the trade of coastal SEA countries.

3.8 Appendix

Table A3-1: Regression with measures of transport performance (Panel 1999-2008) _NO FIXED EFFECT

	Distance	Transport price	Transport time	Variability in percent	Variability in hours	Cost 1	Cost 2	Hassle Index
Importer's Population	-0.171*** (0.0483)	-0.172*** (0.0562)	0.045 (0.0606)	0.042 (0.0582)	0.005 (0.0589)	0.012 (0.0606)	-0.113* (0.0565)	-0.188*** (0.0467)
Importer's GDP	0.851*** (0.0304)	0.994*** (0.0293)	0.843*** (0.0367)	0.882*** (0.0355)	0.829*** (0.0362)	0.899*** (0.0345)	0.885*** (0.0304)	1.042*** (0.0403)
Exporter's Population	0.221*** (0.0382)	-0.029 (0.0578)	0.073 (0.0623)	0.020 (0.0563)	0.0072 (0.0568)	0.074 (0.0639)	-0.004 (0.0566)	0.165*** (0.0453)
Exporter's GDP	0.697*** (0.0246)	0.964*** (0.2788)	0.858*** (0.0312)	0.888*** (0.0322)	0.832*** (0.0323)	0.896*** (0.0285)	0.871*** (0.0271)	0.907*** (0.0424)
Language	-0.566*** (0.0673)	0.227 (0.1066)	-0.356** (0.1117)	0.033 (0.1239)	-0.022 (0.1205)	-0.280* (0.1152)	-0.137 (0.1097)	0.364*** (0.1026)
Adjacency	-0.807*** (0.1643)	2.388*** (0.3630)	1.480*** (0.2505)	2.753*** (0.3892)	2.123*** (0.2982)	1.368*** (0.1728)	1.714*** (0.2406)	-0.072 (0.1336)
Importer's Tariff	-0.059 (0.0547)	0.031 (0.0602)	0.005 (0.0713)	0.015 (0.0712)	-0.017 (0.0687)	0.001 (0.0652)	-0.002 (0.0582)	-0.082 (0.0719)
Importer Landlocked	-0.914*** (0.1152)	0.113 (0.0882)	-0.054 (0.0893)	-0.058 (0.0988)	0.025 (0.0918)	0.192* (0.0862)	0.169* (0.0817)	-0.502** (0.1452)
COMESA	-0.213 (0.2013)	0.137 (0.2078)	-0.245 (0.1909)	-0.085 (0.2496)	0.013 (0.1922)	-0.594** (0.2047)	-0.336 (0.2055)	0.409 (0.2753)
EAC	1.890*** (0.2969)	1.903*** (0.4108)	1.104*** (0.2832)	1.989*** (0.4806)	1.484*** (0.3526)	1.331*** (0.2303)	1.789*** (0.2669)	4.139*** (0.3514)
SACU	-5.308*** (0.5598)	-6.081*** (0.5300)	-6.199*** (0.5191)	-6.269*** (0.5353)	-6.269*** (0.5267)	-5.889*** (0.5304)	-6.051*** (0.5182)	-4.568*** (0.5767)
SADC	-0.949*** (0.2043)	1.554*** (0.3784)	0.889*** (0.2685)	1.868*** (0.4113)	1.298*** (0.3265)	0.252 (0.1790)	0.894*** (0.2589)	3.141*** (0.2177)
Distance	-1.00*** (0.0770)							
Transport Price		-0.747*** (0.0563)						
Transport Time			-1.141*** (0.0933)					
Variability in percent				-0.313*** (0.0571)				
Variability in hours					-0.459*** (0.0519)			
Cost 1						-1.220*** (0.0722)		
Cost 2							-1.204*** (0.0766)	
Hassle Index								0.923*** (0.1417)
Constant	6.804*** (0.7249)	2.317*** (0.6622)	4.056*** (0.7017)	-2.576*** (0.5537)	0.137 (0.6204)	8.853*** (0.7085)	8.491*** (0.8499)	-8.899*** (1.0514)
Number of Obs.	4620	3900	3900	3900	3900	3900	3900	4620
Pseudo R-sq	0.971	0.866	0.8710	0.8476	0.8616	0.8788	0.8802	0.9647
RESET p-val.	0.0000	0.0000	0.0000	0.0000	0.0031	0.0296	0.2336	0.4650
NO IMPORTER – FIXED EFFECT, NO EXPORTER – FIXED EFFECT and NO TIME FIXED EFFECT								

Standard errors in parentheses *p<0.05, **p<0.01 and ***p<0.001

Table A3-2: Gravity model regression with Transport Price on Cross Section

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Importer's Population	-1.437** (0.437)	-0.502 (0.798)	1.472 (8.679)	0.423 (1.323)	-0.751 (0.904)	-0.744 (0.961)	-0.269 (0.776)	0.244 (0.570)	-0.126 (0.490)	0.427 (0.567)
Importer's GDP	1.744* (0.802)	0.679 (1.166)	-2.863 (14.97)	-0.845 (1.230)	1.275 (0.801)	1.600 (1.256)	0.955 (1.061)	0.418 (0.594)	0.728 (0.425)	0.351 (0.403)
Exporter's Population	-1.335 (0.975)	-1.413 (0.799)	6.066 (6.660)	0.353 (0.892)	-0.174 (0.622)	-0.740 (0.760)	-1.638* (0.738)	-1.146* (0.532)	-1.356* (0.559)	-0.671 (0.497)
Exporter's GDP	1.480* (0.689)	1.383 (0.847)	-12.14 (12.01)	-1.042 (0.973)	-0.224 (0.553)	0.259 (1.185)	0.990 (0.653)	0.786* (0.356)	0.522 (0.354)	0.548* (0.266)
Language	-0.222 (0.387)	-0.253 (0.332)	0.322 (0.406)	0.0398 (0.314)	0.00826 (0.375)	0.107 (0.367)	0.00449 (0.382)	-0.0533 (0.372)	0.00205 (0.355)	0.053 (0.294)
Adjacency	0.893 (0.473)	1.765*** (0.492)	1.767*** (0.502)	2.032*** (0.431)	2.106*** (0.421)	1.918*** (0.435)	1.841*** (0.529)	2.012*** (0.570)	1.926*** (0.484)	1.853*** (0.474)
Importer's Tariff	0.644 (0.452)	0.315 (0.617)	0.0173 (0.356)	-0.0966 (0.514)	-0.00213 (0.314)	0.0668 (0.659)	-0.325 (0.532)	1.173 (0.893)	-0.667 (0.703)	1.773* (0.903)
Importer Landlocked	0.230 (0.468)	0.344 (0.886)	-1.141 (5.886)	-0.341 (0.474)	0.448 (0.391)	0.581 (0.502)	0.456 (0.441)	0.392 (0.304)	0.301 (0.295)	0.364 (0.250)
COMESA	0.524 (0.387)	-0.0065 (0.421)	-0.305 (0.455)	0.112 (0.425)	0.400 (0.429)	0.136 (0.397)	0.620 (0.626)	0.296 (0.625)	-0.558 (0.502)	-0.666 (0.510)
EAC	2.979*** (0.756)	2.214** (0.744)	2.512*** (0.748)	1.735* (0.703)	1.390* (0.628)	1.625* (0.707)	1.630* (0.795)	1.680* (0.818)	2.049** (0.693)	2.274** (0.746)
SACU			-9.776*** (0.733)	-6.734*** (1.302)	-6.979*** (1.419)	-6.833*** (1.308)	-6.496*** (1.301)	-6.656*** (1.326)	-6.034*** (1.274)	-5.185*** (1.285)
SADC	0.240 (0.508)	-0.700 (0.624)	-0.0276 (0.593)	-0.415 (0.531)	-0.684 (0.691)	0.644 (0.412)	0.607 (0.437)	0.690 (0.487)	0.338 (0.374)	0.530 (0.421)
Transport Price	-0.690*** (0.203)	-0.591** (0.194)	-0.659*** (0.175)	-0.641*** (0.162)	-0.718*** (0.168)	-0.625*** (0.186)	-0.791** (0.243)	-0.742*** (0.223)	-0.655** (0.249)	-0.7688*** (0.190)
Constant	7.292* (3.253)	6.701 (4.961)	8.648 (5.032)	7.032* (3.305)	7.232** (2.611)	5.793 (3.453)	9.226* (4.012)	3.568 (4.516)	9.775* (4.275)	1.452 (4.002)
Number of Obs.	390	390	390	390	390	390	390	390	390	390
Pseudo R-sq	0.951	0.943	0.939	0.941	0.938	0.941	0.931	0.928	0.937	0.939
IMPORTER – FIXED EFFECT, EXPORTER – FIXED EFFECT and TIME FIXED EFFECT										
The Null Hypothesis: Import value follows that same size of a regression coefficient across years (1999-2008) Chi2 = 3.71, Prob > Chi2 = 0.9294, and Fail to reject the null Hypothesis.										

Standard errors in parentheses *p<0.05, **p<0.01 and ***p<0.001

Table A3-3: Gravity model regression with Transport Time on Cross Section

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Importer's Population	-1.543*** (0.319)	-0.00935 (0.837)	-2.804 (7.926)	-0.198 (1.219)	-1.322 (0.819)	-1.328 (0.899)	-0.600 (0.694)	0.126 (0.503)	-0.243 (0.401)	0.307 (0.456)
Importer's GDP	1.393* (0.655)	-0.0128 (1.142)	4.502 (13.67)	-0.208 (1.167)	1.819* (0.760)	2.717* (1.166)	1.698 (1.083)	0.898 (0.534)	1.120** (0.383)	0.752* (0.306)
Exporter's Population	-1.339 (0.934)	-1.295 (0.816)	5.124 (6.795)	0.204 (0.854)	-0.337 (0.625)	-0.954 (0.781)	-1.500* (0.732)	-1.129* (0.529)	-1.175* (0.549)	-0.622 (0.488)
Exporter's GDP	1.479* (0.732)	1.215 (0.884)	-10.37 (12.34)	-0.893 (0.984)	0.190 (0.625)	0.562 (1.257)	1.409 (0.737)	0.955** (0.359)	0.730* (0.336)	0.681** (0.230)
Language	-0.824 (0.511)	-0.785* (0.381)	-0.225 (0.493)	-0.576 (0.362)	-0.748 (0.473)	-0.386 (0.434)	-0.761 (0.431)	-0.710 (0.407)	-0.593 (0.380)	-0.517 (0.297)
Adjacency	0.248 (0.442)	1.190* (0.464)	1.293** (0.481)	1.514*** (0.394)	1.677*** (0.369)	1.750*** (0.425)	1.563*** (0.462)	1.679*** (0.480)	1.542*** (0.416)	1.272*** (0.383)
Importer's Tariff	0.561 (0.396)	0.725 (0.674)	0.151 (0.339)	0.142 (0.596)	0.299 (0.304)	0.328 (0.768)	0.0226 (0.480)	1.312 (0.850)	-0.400 (0.593)	2.308* (0.924)
Importer Landlocked	-0.868* (0.353)	-0.288 (0.825)	1.006 (5.361)	-0.921* (0.375)	-0.236 (0.338)	0.341 (0.439)	-0.0439 (0.418)	-0.173 (0.297)	-0.213 (0.235)	-0.128 (0.247)
COMESA	-0.0237 (0.397)	-0.471 (0.445)	-0.574 (0.418)	-0.247 (0.416)	-0.0269 (0.419)	-0.128 (0.419)	0.237 (0.592)	0.0167 (0.548)	-0.809* (0.403)	-0.909* (0.402)
EAC	2.752*** (0.515)	2.023*** (0.532)	2.169*** (0.554)	1.470** (0.503)	1.092* (0.527)	1.049 (0.621)	0.877 (0.744)	0.875 (0.811)	1.263 (0.671)	1.469 (0.777)
SACU			-9.561*** (0.822)	-6.614*** (1.327)	-7.043*** (1.421)	-6.918*** (1.324)	-6.703*** (1.314)	-6.823*** (1.334)	-6.148*** (1.237)	-5.229*** (1.238)
SADC	-0.0318 (0.460)	-0.836 (0.575)	-0.144 (0.536)	-0.526 (0.479)	-0.691 (0.598)	0.393 (0.406)	0.402 (0.418)	0.476 (0.471)	0.117 (0.331)	0.430 (0.387)
Transport Time	-1.128*** (0.192)	-1.008*** (0.199)	-0.857*** (0.241)	-0.948*** (0.187)	-1.024*** (0.200)	-0.776*** (0.217)	-1.081*** (0.227)	-1.104*** (0.232)	-1.086*** (0.237)	-1.308*** (0.184)
Constant	10.72*** (2.585)	7.394 (4.805)	6.598 (4.549)	8.505** (3.067)	8.191*** (2.376)	4.615 (3.405)	7.329* (3.544)	3.269 (3.829)	9.389** (3.382)	1.004 (3.604)
Number of Obs.	390	390	390	390	390	390	390	390	390	390
Pseudo R-sq	0.956	0.949	0.942	0.945	0.942	0.943	0.935	0.934	0.943	0.950
IMPORTER – FIXED EFFECT, EXPORTER – FIXED EFFECT and TIME FIXED EFFECT										
The Null Hypothesis: Import value follows that same size of a regression coefficient across years (1999-2008) Chi2 = 5.22 , Prob > Chi2 = 0.8143 , and Fail to reject the null Hypothesis.										

Standard errors in parentheses *p<0.05, **p<0.01 and ***p<0.001

Table A3-4: Gravity model regression with Variability in percent on Cross Section

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Importer's Population	-1.312** (0.465)	-0.423 (0.774)	-0.951 (9.211)	0.132 (1.394)	-0.999 (1.014)	-0.839 (1.129)	-0.214 (0.976)	0.272 (0.689)	-0.0212 (0.604)	0.366 (0.632)
Importer's GDP	1.451 (0.880)	0.369 (1.190)	1.369 (15.83)	-0.628 (1.281)	1.404 (0.829)	1.752 (1.404)	0.857 (1.370)	0.342 (0.732)	0.648 (0.514)	0.377 (0.451)
Exporter's Population	-1.275 (0.858)	-1.706** (0.644)	5.505 (6.267)	0.280 (0.913)	-0.223 (0.612)	-0.700 (0.836)	-1.332 (0.814)	-1.183* (0.526)	-1.115 (0.598)	-0.809 (0.461)
Exporter's GDP	1.305* (0.660)	1.549* (0.751)	-11.22 (11.19)	-1.254 (0.935)	-0.224 (0.553)	-0.0198 (1.217)	-0.895 (0.769)	0.708 (0.392)	0.492 (0.357)	-0.506* (0.250)
Language	-0.520 (0.488)	-0.508 (0.384)	-0.0421 (0.486)	-0.298 (0.394)	-0.411 (0.482)	-0.144 (0.432)	-0.493 (0.432)	-0.487 (0.411)	-0.450 (0.375)	-0.372 (0.318)
Adjacency	1.318** (0.439)	2.046*** (0.468)	2.181*** (0.486)	2.325*** (0.425)	2.459*** (0.430)	2.251*** (0.476)	2.334*** (0.560)	2.479*** (0.585)	2.337*** (0.490)	2.256*** (0.464)
Importer's Tariff	0.868 (0.484)	0.317 (0.582)	0.265 (0.411)	-0.0718 (0.542)	0.240 (0.382)	0.250 (0.687)	-0.0235 (0.604)	1.210 (0.868)	-0.297 (0.781)	1.524 (0.830)
Importer Landlocked	-0.320 (0.516)	-0.170 (0.875)	0.0416 (6.227)	-0.758 (0.503)	-0.0642 (0.423)	0.202 (0.539)	-0.0309 (0.528)	-0.103 (0.363)	-0.0246 (0.290)	-0.00847 (0.289)
COMESA	0.399 (0.474)	-0.255 (0.537)	-0.580 (0.599)	-0.159 (0.548)	0.0437 (0.581)	-0.219 (0.648)	0.0644 (0.851)	-0.249 (0.847)	-1.008 (0.676)	-1.239 (0.710)
EAC	2.493** (0.850)	2.073* (0.860)	2.256* (0.908)	1.587 (0.857)	1.263 (0.806)	1.580 (0.859)	1.640 (1.014)	1.725 (1.028)	2.212* (0.862)	2.623** (0.878)
SACU			-9.662*** (0.698)	-6.651*** (1.283)	-6.762*** (1.411)	-6.807*** (1.297)	-6.590*** (1.276)	-6.716*** (1.301)	-6.162*** (1.279)	-5.239*** (1.266)
SADC	0.0921 (0.521)	-0.711 (0.601)	-0.0849 (0.608)	-0.405 (0.519)	-0.765 (0.715)	0.672 (0.448)	0.611 (0.502)	0.673 (0.512)	0.345 (0.445)	0.564 (0.456)
Variability in percent	-0.0526 (0.159)	-0.0505 (0.170)	0.0752 (0.169)	-0.0370 (0.165)	-0.0490 (0.183)	0.0115 (0.181)	0.0723 (0.179)	0.0642 (0.180)	0.169 (0.193)	0.0871 (0.166)
Constant	1.928 (3.032)	3.290 (5.047)	1.247 (5.193)	3.216 (3.648)	2.143 (3.359)	0.601 (3.578)	1.302 (4.400)	-2.345 (4.384)	1.903 (4.533)	-3.918 (3.687)
Number of Obs.	390	390	390	390	390	390	390	390	390	390
Pseudo R-sq	0.947	0.940	0.935	0.936	0.931	0.937	0.922	0.920	0.932	0.932
IMPORTER – FIXED EFFECT, EXPORTER – FIXED EFFECT and TIME FIXED EFFECT										
The Null Hypothesis: Import value follows that same size of a regression coefficient across years (1999-2008) Chi2 = 2.33 , Prob > Chi2 = 0.9851 , and Fail to reject the null Hypothesis.										

Standard errors in parentheses *p<0.05, **p<0.01 and ***p<0.001

Table A3-5: Gravity model regression with Variability in hours on Cross Section

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Importer's Population	-1.623*** (0.399)	-0.199 (0.813)	-1.152 (8.469)	-0.0724 (1.281)	-1.428 (0.883)	-1.291 (0.989)	-0.628 (0.844)	-0.0471 (0.602)	-0.308 (0.528)	0.214 (0.534)
Importer's GDP	1.580* (0.767)	0.244 (1.140)	1.474 (14.55)	-0.531 (1.197)	1.676* (0.749)	2.345 (1.242)	1.329 (1.218)	0.674 (0.626)	0.950* (0.456)	0.670 (0.379)
Exporter's Population	-1.682 (0.938)	-1.701* (0.749)	5.927 (7.062)	0.246 (0.938)	-0.479 (0.622)	-0.996 (0.823)	-1.642* (0.807)	-1.361* (0.546)	-1.326* (0.618)	-0.833 (0.494)
Exporter's GDP	1.709* (0.833)	1.578 (0.893)	-12.08 (12.65)	-1.199 (1.007)	0.0135 (0.603)	0.334 (1.237)	1.173 (0.783)	0.875* (0.405)	0.689 (0.388)	0.703** (0.265)
Language	-0.397 (0.432)	-0.369 (0.331)	0.090 (0.452)	-0.221 (0.342)	-0.332 (0.425)	-0.121 (0.410)	-0.374 (0.395)	-0.354 (0.387)	-0.270 (0.352)	-0.173 (0.285)
Adjacency	0.662 (0.417)	1.477** (0.475)	1.695*** (0.509)	1.749*** (0.416)	1.900*** (0.407)	1.935*** (0.432)	1.906*** (0.495)	1.977*** (0.530)	1.941*** (0.473)	1.764*** (0.426)
Importer's Tariff	0.542 (0.446)	0.689 (0.645)	0.236 (0.395)	-0.00707 (0.567)	0.261 (0.349)	0.239 (0.723)	-0.0904 (0.601)	1.159 (0.907)	-0.339 (0.812)	1.757 (0.923)
Importer Landlocked	-0.521 (0.418)	-0.0261 (0.838)	-0.0151 (5.717)	-0.876 (0.448)	-0.221 (0.375)	0.141 (0.481)	-0.357 (0.511)	-0.467 (0.365)	-0.317 (0.312)	-0.409 (0.298)
COMESA	0.242 (0.397)	-0.278 (0.448)	-0.488 (0.490)	-0.0936 (0.433)	0.0465 (0.443)	-0.266 (0.499)	0.0109 (0.708)	-0.302 (0.691)	-1.040 (0.554)	-1.300* (0.551)
EAC	2.692*** (0.637)	2.132*** (0.640)	2.307** (0.723)	1.617** (0.623)	1.304* (0.578)	1.480* (0.693)	1.464 (0.853)	1.621 (0.873)	2.076** (0.724)	2.404** (0.755)
SACU			-9.558*** (0.777)	-6.550*** (1.315)	-6.777*** (1.422)	-6.728*** (1.320)	-6.465*** (1.301)	-6.526*** (1.335)	-5.949*** (1.263)	-4.972*** (1.269)
SADC	0.0259 (0.459)	-0.784 (0.556)	-0.112 (0.548)	-0.479 (0.471)	-0.731 (0.589)	0.558 (0.398)	0.552 (0.424)	0.660 (0.478)	0.396 (0.378)	0.764 (0.428)
Variability in hours	0.539*** (0.157)	-0.496** (0.155)	-0.325 (0.185)	-0.478*** (0.145)	-0.501** (0.165)	-0.339 (0.178)	-0.420* (0.188)	-0.453* (0.192)	-0.339 (0.199)	-0.439** (0.148)
Constant	7.729* (3.087)	5.089 (4.914)	4.725 (4.849)	6.871* (3.426)	6.845* (2.946)	3.814 (3.669)	6.003 (4.455)	2.330 (4.529)	6.158 (4.578)	-1.019 (3.785)
Number of Obs.	390	390	390	390	390	390	390	390	390	390
Pseudo R-sq	0.951	0.945	0.937	0.941	0.937	0.939	0.926	0.925	0.934	0.937
IMPORTER – FIXED EFFECT, EXPORTER – FIXED EFFECT and TIME FIXED EFFECT										
The Null Hypothesis: Import value follows that same size of a regression coefficient across years (1999-2008) Chi2 = 5.95 , Prob > Chi2 = 0.7452 , and Fail to reject the null Hypothesis.										

Standard errors in parentheses *p<0.05, **p<0.01 and ***p<0.001

Table A3-6: Gravity model regression with Cost 1 on Cross Section

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Importer's Population	-1.420*** (0.394)	-0.242 (0.822)	-0.271 (8.395)	0.266 (1.284)	-0.915 (0.877)	-0.921 (0.960)	-0.349 (0.744)	0.140 (0.546)	-0.188 (0.449)	0.332 (0.516)
Importer's GDP	1.670* (0.728)	0.450 (1.131)	0.161 (14.47)1	-0.658 (1.204)	1.425 (0.792)	1.940 (1.243)	1.095 (1.047)	0.538 (0.569)	0.806* (0.399)	0.456 (0.362)
Exporter's Population	-1.289 (0.922)	-1.353 (0.768)	6.479 (6.205)	0.451 (0.816)	-0.0934 (0.563)	-0.638 (0.702)	-1.343 (0.688)	-0.999* (0.485)	-1.128* (0.523)	-0.475 (0.473)
Exporter's GDP	1.574* (0.688)	1.446 (0.806)	-12.80 (11.23)	-1.149 (0.921)	-0.172 (0.533)	0.0904 (1.097)	0.963 (0.625)	0.704* (0.317)	0.473 (0.304)	0.490* (0.224)
Language	-0.629 (0.529)	-0.584 (0.410)	-0.0625 (0.511)	-0.359 (0.399)	-0.486 (0.499)	-0.208 (0.439)	-0.524 (0.428)	-0.515 (0.410)	-0.393 (0.381)	-0.319 (0.301)
Adjacency	0.719 (0.425)	1.577*** (0.469)	1.744*** (0.488)	1.942*** (0.417)	2.047*** (0.409)	1.965*** (0.442)	1.751*** (0.493)	1.887*** (0.530)	1.731*** (0.454)	1.527*** (0.425)
Importer's Tariff	0.653 (0.433)	0.512 (0.655)	0.111 (0.359)	-0.00244 (0.582)	0.137 (0.326)	0.290 (0.757)	-0.141 (0.490)	1.175 (0.884)	-0.566 (0.603)	2.113* (0.931)
Importer Landlocked	-0.262 (0.412)	0.0681 (0.840)	-0.411 (5.695)	-0.713 (0.433)	0.00492 (0.355)	0.289 (0.480)	0.0356 (0.395)	-0.0659 (0.265)	-0.0735 (0.197)	-0.0036 (0.210)
COMESA	0.00302 (0.403)	-0.417 (0.438)	-0.590 (0.458)	-0.226 (0.432)	0.00390 (0.441)	-0.152 (0.440)	0.233 (0.588)	-0.00267 (0.567)	-0.813* (0.414)	-0.921* (0.425)
EAC	2.958*** (0.652)	2.200*** (0.666)	2.273** (0.711)	1.576* (0.664)	1.220* (0.602)	1.332* (0.677)	1.360 (0.759)	1.445 (0.787)	1.824** (0.639)	2.228* (0.731)
SACU			-9.580*** (0.732)	-6.568*** (1.298)	-6.812*** (1.407)	-6.767*** (1.309)	-6.415*** (1.292)	-6.524*** |(0.492)	0.264 (0.356)	0.584 (0.426)
SADC	0.141 (0.474)	-0.704 (0.595)	-0.0968 (0.566)	-0.457 (0.512)	-0.733 (0.659)	0.529 (0.411)	0.550 (0.429)	0.640 (0.492)	0.264 (0.356)	0.584 (0.426)
Cost 1	-1.138*** (0.201)	-1.018*** (0.218)	-0.761** (0.269)	-0.875*** (0.203)	-0.955*** (0.223)	-0.744** (0.254)	-1.145*** (0.267)	-1.119*** (0.27)	-1.138*** (0.296)	-1.363*** (0.207)
Constant	12.28*** (2.995)	10.31* (4.983)	9.275 (5.144)	9.891*** (3.356)	10.11*** (2.864)	6.980 (3.956)	12.34** (3.968)	7.888 (4.754)	14.35*** (4.118)	6.462 (4.234)
Number of Obs.	390	390	390	390	390	390	390	390	390	390
Pseudo R-sq	0.954	0.947	0.939	0.942	0.938	0.941	0.933	0.930	0.941	0.946
IMPORTER – FIXED EFFECT, EXPORTER – FIXED EFFECT and TIME FIXED EFFECT										
The Null Hypothesis: Import value follows that same size of a regression coefficient across years (1999-2008) Chi2 = 5.95 , Prob > Chi2 = 0.7452, and Fail to reject the null Hypothesis.										

Standard errors in parentheses *p<0.05, **p<0.01 and ***p<0.001

Table A3-7: Gravity model regression with Cost 2 on Cross Section

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Importer's Population	-1.621*** (0.382)	-0.362 (0.819)	0.0574 (8.186)	0.192 (1.251)	-1.101 (0.841)	-1.107 (0.908)	-0.523 (0.714)	0.0311 (0.521)	-0.290 (0.432)	0.281 (0.492)
Importer's GDP	1.808* (0.702)	0.525 (1.110)	-0.545 (14.12)	-0.682 (1.178)	1.512* (0.766)	2.126 (1.186)	1.305 (1.015)	0.668 (0.542)	0.927* (0.380)	0.569 (0.349)
Exporter's Population	-1.449 (0.960)	-1.357 (0.839)	5.946 (6.816)	0.346 (0.867)	-0.274 (0.603)	-0.859 (0.737)	-1.588* (0.703)	-1.153* (0.508)	-1.314* (0.553)	-0.587 (0.496)
Exporter's GDP	1.700* (0.761)	1.393 (0.907)	-11.90 (12.32)	-1.043 (0.995)	-0.0268 (0.583)	0.373 (1.171)	1.171 (0.663)	0.854* (0.345)	0.629 (0.339)	0.640* (0.253)
Language	-0.376 (0.438)	-0.373 (0.346)	0.103 (0.455)	-0.181 (0.348)	-0.255 (0.422)	-0.0752 (0.398)	-0.245 (0.377)	-0.259 (0.377)	-0.153 (0.348)	-0.0765 (0.278)
Adjacency	0.536 (0.432)	1.478** (0.473)	1.605** (0.490)	1.819*** (0.411)	1.925*** (0.399)	1.876*** (0.414)	1.699*** (0.465)	1.809*** (0.509)	1.723*** (0.450)	1.542*** (0.414)
Importer's Tariff	0.561 (0.419)	0.529 (0.658)	0.123 (0.357)	-0.0563 (0.561)	0.140 (0.318)	0.192 (0.736)	-0.199 (0.507)	1.136 (0.895)	-0.585 (0.662)	1.952* (0.937)
Importer Landlocked	-0.146 (0.379)	0.187 (0.833)	-0.622 (5.557)	-0.657 (0.424)	0.0610 (0.345)	0.288 (0.462)	-0.0964 (0.406)	-0.173 (0.266)	-0.123 (0.222)	-0.292 (0.238)
COMESA	0.0522 (0.413)	-0.313 (0.432)	-0.515 (0.437)	-0.134 (0.416)	0.0654 (0.417)	-0.163 (0.413)	0.213 (0.565)	-0.0577 (0.545)	-0.811* (0.412)	-1.022* (0.419)
EAC	3.168*** (0.643)	2.285*** (0.643)	2.395*** (0.676)	1.676** (0.622)	1.341* (0.564)	1.434* (0.653)	1.391 (0.732)	1.527* (0.760)	1.879** (0.622)	2.202** (0.695)
SACU			-9.606*** (0.771)	-6.595*** (1.312)	-6.879*** (1.416)	-6.771*** (1.319)	-6.453*** (1.318)	-6.533*** (1.348)	-5.956*** (1.277)	-5.013*** (1.295)
SADC	0.144 (0.475)	-0.745 (0.594)	-0.111 (0.557)	-0.483 (0.503)	-0.737 (0.623)	0.537 (0.392)	0.527 (0.396)	0.632 (0.471)	0.306 (0.337)	0.637 (0.413)
Cost 2	-1.127*** (0.227)	-0.958*** (0.225)	-0.781** (0.262)	-0.869*** (0.208)	-0.949*** (0.219)	-0.744** (0.247)	-1.050*** (0.262)	-1.042*** (0.268)	-0.976** (0.302)	-1.181*** (0.215)
Constant	12.97*** (3.278)	9.997* (5.009)	9.991 (5.164)	10.40** (3.377)	10.78*** (2.911)	7.682 (4.002)	12.26** (4.118)	7.722 (4.802)	13.29** (4.472)	5.583 (4.346)
Number of Obs.	390	390	390	390	390	390	390	390	390	390
Pseudo R-sq	0.954	0.947	0.940	0.943	0.939	0.941	0.934	0.931	0.940	0.944
IMPORTER – FIXED EFFECT, EXPORTER – FIXED EFFECT and TIME FIXED EFFECT										
The Null Hypothesis: Import value follows that same size of a regression coefficient across years (1999-2008) Chi2 = 0.77, Prob > Chi2 = 0.9998 , and Fail to reject the null Hypothesis.										

Standard errors in parentheses *p<0.05, **p<0.01 and ***p<0.001

Table A3-8: Gravity model regression with Hassle Index on Cross Section

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Importer's Population	-0.580 (0.859)	0.853 (0.995)	3.558 (9.265)	0.783 (1.235)	-0.343 (1.005)	0.0756 (0.898)	0.217 (0.768)	0.285 (0.583)	0.197 (0.539)	0.334 (0.535)
Importer's GDP	1.334 (1.040)	0.151 (1.215)	-6.474 (16.34)	-1.029 (1.208)	1.183 (0.885)	0.868 (1.374)	0.668 (1.056)	0.175 (0.573)	0.461 (0.454)	0.198 (0.405)
Exporter's Population	-2.020 (1.321)	-1.518 (0.995)	12.78 (7.650)	0.951 (1.213)	0.185 (0.913)	0.226 (0.899)	-0.718 (0.926)	-0.873 (0.676)1	-0.482 (0.650)	-0.518 (0.551)
Exporter's GDP	2.381* (1.130)	1.992 (1.044)	-24.56 (13.66)	-2.043 (1.066)	-0.960 (0.681)	-0.939 (1.142)	0.630 (0.856)	0.422 (0.442)	0.407 (0.402)	0.311 (0.279)
Language	0.424 (0.218)	0.305 (0.212)	0.477* (0.220)	0.309 (0.216)	0.239 (0.210)	0.340 (0.195)	0.408* (0.177)	0.430* (0.196)	0.470* (0.196)	0.520* (0.207)
Adjacency	0.613 (0.383)	0.685 (0.375)	0.261 (0.390)	0.390 (0.410)	0.562 (0.361)	0.509 (0.340)	0.498 (0.301)	0.387 (0.312)	0.329 (0.298)	0.403 (0.244)
Importer's Tariff	-0.299 (0.666)	0.783 (0.528)	-0.0995 (0.463)	0.0666 (0.603)	-0.221 (0.360)	0.271 (0.355)	0.154 (0.619)	-0.0908 (0.833)	0.434 (0.712)	-0.576 (0.961)
Importer Landlocked	-0.181 (0.600)	0.425 (0.763)	-2.935 (6.473)	-0.683 (0.557)	0.025 (0.479)	0.152 (0.589)	0.0893 (0.479)	-0.0924 (0.408)	0.0248 (0.366)	-0.0608 (0.362)
COMESA	1.667* (0.735)	1.480 (0.838)	0.844 (0.827)	1.362 (0.777)	2.324** (0.866)	0.637 (0.535)	1.048 (0.746)	0.793 (0.714)	0.00288 (0.607)	-0.188 (0.587)
EAC	3.974*** (1.040)	4.252*** (1.064)	4.788*** (1.060)	4.280*** (1.034)	3.141** (1.012)	4.463*** (0.712)	4.072*** (0.862)	4.081*** (0.822)	4.839*** (0.739)	4.825*** (0.702)
SACU			-8.434*** (1.012)	-5.512*** (1.474)	-5.357*** (1.537)	-5.989*** (1.401)	-5.652*** (1.405)	-5.448*** (1.408)	-4.912*** (1.361)	-3.976** (1.313)
SADC	3.144*** (0.664)	2.905*** (0.722)	2.940*** (0.752)	2.976*** (0.672)	2.383** (0.851)	3.837*** (0.445)	3.458*** (0.501)	3.295*** (0.515)	3.238*** (0.497)	3.173*** (0.439)
Hassle Index	0.986 (0.737)	1.110 (0.737)	0.318 (0.841)	0.567 (0.855)	0.876 (0.760)	0.942 (0.782)	0.866 (0.731)	0.620 (0.735)	0.479 (0.729)	0.510 (0.594)
Constant	-5.650 (7.378)	-12.58 (7.856)	0.671 (9.840)	-5.246 (8.043)	-6.327 (6.962)	-8.935 (7.475)	-8.089 (6.898)	-3.977 (6.919)	-5.820 (6.497)	-2.689 (6.015)
Number of Obs.	420	420	420	420	420	420	420	420	420	420
Pseudo R-sq	0.983	0.983	0.982	0.980	0.981	0.983	0.983	0.982	0.983	0.985
IMPORTER – FIXED EFFECT, EXPORTER – FIXED EFFECT and TIME FIXED EFFECT										
The Null Hypothesis: Import value follows that same size of a regression coefficient across years (1999-2008) Chi2 = , Prob > Chi2 = , and Fail to reject the null Hypothesis.										

Standard errors in parentheses *p<0.05, **p<0.01 and ***p<0.001

Chapter 4

International Trade and Regional Trade Agreement

4.1 Introduction

At the beginning of the 1990s, the WTO recognized 40 regional and bilateral agreements that were in force. Twenty years later, this number has grown to 202[25]. Of these 202 regional and bilateral trade agreements reported to the WTO, 109 are bilateral agreements; 57 are agreements between a country or a regional grouping with another regional grouping; and 36 are pure regional trade agreements (RTAs). This paper is intended to investigate the performance of the main RTAs in developing countries

RTAs are forms of trade pacts between countries. They eliminate tariffs, quotas and other barriers for a number of goods traded among involved members. The aim of RTAs is to increase trade between member countries as a result of relaxing or removing existing institutional and economic barriers. However, it is important to note that RTAs can also be harmful, both to member countries and nonmember countries, especially when they are pursued not as a complement, but as a substitute for multilateral liberalization. In such cases, increased protection of vested interests can turn the agreements into closed blocs, discouraging multilateralism, and distorting the pattern of international trade (Tumbarello, 2007).

The primary objective of this chapter is to investigate the effect of RTAs on intra- and extra-regional trade flows by a comparison of trade patterns before and after the start of the RTA process in developing countries. This chapter considers not only intra-RTA trade but also the effect of RTAs on non-member trade. Ideally, we would like to include all possible RTAs in a single regression to avoid bias in the results. Unfortunately it requires more computational

[25] (Updated October 2010) This number count only single RTA name for instance EC treaty started in 1957, enlarged to 9 members in 1972, enlarged to 10 members, 12 members, 15 members, 25 members, 27 members in 1979, 1985, 1994, 2004 and 2006 respectively. The total number of RTA in WTO record is 225.

capacity which is limited[26]. With these capacity limitations, we are able to study only certain large developing RTAs. However Hamilton and Winters (1992) gave an example that many small RTAs formed of low and middle income countries have little effect on world trade flows.

In this chapter, we focus on 12 of the pure RTAs shown in table 4-1. These twelve RTAs are the major RTAs of developing countries and cover various regions. Individual member countries are listed in the appendix.

Table 4-1: Selected RTAs in Developing Countries

Agreement		Type	Region
AFTA	ASEAN Free Trade Area	FTA	South East Asia
CAN	Andrean Community	CU	Western Hemisphere
CEMAC	Economic and Monetary Community of Central Africa	CU	Sub-Saharan African
CIS	Commonwealth of Independent States	FTA	Europe and Central Asian
EAC	East African Community	CU	Sub-Saharan African
ECOWAS	Economic Community of West Africa	CU	Sub-Saharan African
GCC	Gulf Cooperation Council	CU	Middle East
MERCOSUR	Southern Common Market	CU&EIA	Western Hemisphere
PAFTA	Pan-Arab Free Trade Area	FTA	Middle East & North Africa
SADC	Southern African Development Community	FTA	Sub-Saharan African
SAPTA	Southern Asian Preferential Trade Arrangement	PTA	South Asia
WAEMU	West African Economic and Monetary Union	CU	Sub-Saharan African

Source: Authors' collected

The chapter is organized as follows: the next section provides a literature review of RTA research. Section 4.3 describes the methodology and the gravity model of the impact of RTAs, while section 4.4 discusses the results and section 4.5 presents conclusions.

[26] If we do not include exporter fixed effect, importer fixed effect and time fixed effect, we would be able to include more possible RTAs into single regression.

4.2 Review of the effects of RTAs

The tools to assess the effects of RTA fall into two categories: *ex post* and *ex ante*. *Ex ante* analyses are based on computable general equilibrium models (CGE) and are used to predict the effects of a RTA before it is formed. Assessments of resource allocation effects and welfare changes are based on estimated parameters and data corresponding to the period preceding the formation of the RTA. *Ex post* analyses utilize data available after the RTA has been formed. These studies often focus on the effect of RTAs on the trade shares of members and nonmembers (Rivera-Batiz & Oliva, 2003).

However each approach has an inherent weakness. CGE analyses suffer from a number of theoretical and practical difficulties such as assuming fixed terms of trade, assuming many elasticities of substitution, assuming comprehensive across-the-board elimination of tariffs and ignoring many of the potentially trade-restrictive non-tariff measures. By contrast, *ex post* studying based on econometric methods cannot establish welfare effects directly (Dee & Gali, 2005). The gravity model, the economic model used in this chapter, is the key *ex post* technique for evaluation of the effects of RTAs.

The debate over the welfare effects of RTAs and their likely impacts on the multilateral trading system can be divided into three categories. One school of thought views RTAs as reducing global welfare and creating “stumbling blocks” to multilateral free trade ((Bhagwati & Krueger, 1995) (Bhagwati & Panagariya, 1996) (Srinivasan , 1998)). The other school of thought argues that RTAs are likely to raise global welfare and can act as “building blocks” to multilateral free trade (Ethier, 1998). This can be thought of two sides of the same coin. On the one hand, RTA leads some to fear that regionalism corrupts and undermines progress toward global trade liberalization expounded by the WTO. On the other hand, any trade liberalization is good whatever its source and RTAs act as a second-best means of achieving trade liberalization when

multilateral progress is delayed. Another issue is that there are natural trading blocs among neighboring countries – low transportation costs contribute to welfare gains when these countries form a RTA (Krugman, 1993). Also there are some concerns associated with the proliferation of RTAs such as a costly hub-and-spoke structure of trades[27] and spaghetti bowl phenomenon[28].

In order to minimize the risks that RTAs can have negative welfare effects, they should have a well-designed comprehensive framework. Best practice in designing RTAs should include low external barriers and a continued commitment to MFN liberalization. Open access to membership, consistency among different agreements and comprehensive coverage of goods with little exclusion all are important factors. In addition, symmetrical and simple rules of origin with transparent and consistent regulations, behind-the-border reforms to promote synergies and strengthen the supply response, and the establishment of dispute settlement provisions must to be included in the RTA framework as well (Bank, 2006).

The welfare effects of RTAs have been assessed in terms of trade creation and trade diversion. Viner's (1950) classic analysis of custom union focus on the trade effects of exogenously determined external tariff structures in a perfect competition model with constant returns to scale. Trade creation takes place when the imports and exports of members of a preferential arrangement expand due to the elimination of internal trade barriers. High-price products that are produced locally at relatively high costs can be imported from low-cost members. Trade diversion occurs when trade shifts from outside trading partners to members of the preferential

[27] Such a structure can emerge when the largest RTA member (Hub) signs individual agreements with a wide range of peripheral countries (Spokes), among which market access remains restricted. Such arrangements can marginalize the spokes, where market access conditions are less advantageous than in the hub, which enjoys improved access to all of the spokes. Such a game may generate lower gain among the spoke members, which will accrue mainly to the hub country (Deltas, Desmet, & Facchini, 2006).

[28] '*Spaghetti bowl phenomenon*'was first used by Jagdish Bhagwati in "U.S. Trade Policy: The Infatuation with Free Trade Agreements" in Jagdish Bhagwati and Anne O. Krueger, The Dangerous Drift to Preferential Trade Agreements, AEI Press, 1995. This term refers to the potential problems arising from lack of coherence among different overlapping agreements. There has been little effort toward regulatory harmonization and consistency among agreements. As a result, restrictive and inconsistent rules of origin across agreements can complicate outsourcing decisions by firms and add fragility to the trading system. Furthermore, the outcome of a trade dispute between two members has the potential to spill over to other countries in the regional trade relations. In the absence of a regional dispute settlement mechanism, there is a potential risk of disruption in intra-regional trade (Tumbarello, 2007).

arrangement. A product that is available at a relatively low price from a more efficient outsider is produced at a higher cost and sold at a higher price within arrangement. Trade diversion induced inefficient production within the arrangement and lowers consumer surplus. The balance between trade diversion and trade creation is one of the key elements determining the net welfare effects of a preferential arrangement (Rivera-Batiz & Oliva, 2003).

Viner's (1950) definition relates to price so the net trade effects from the gravity model cannot be used to access precisely the effects on economic welfare. The next section will show the gravity model approach to investigate the trade creation and the trade diversion effects of RTAs.

4.3 Gravity model of the impact of RTAs

The following is a brief review of gravity model approaches to study the impact of RTAs. The first extended gravity model's use of a regional dummy to capture the RTA's effect on intra trade initially was done by Aitken (1973). Later Bayoumi and Eichengreen (1995) and Frankel (1997) added a second dummy to test the RTA effect on the trade of bloc members with nonmembers. Recently Soloaga and Winters (2001) incorporated three dummy variables in order to offer a simple and clear distinction between the trade creation and trade diversion. The first dummy captures the trade creation. The second and the third dummy variables capture the import trade diversion and the export trade diversion, respectively. They argued that both are needed because bloc member's imports and exports could follow different patterns after the formation of a RTA. Here we follow the specification of Soloaga and Winters (2001) who separate dummies for member's imports from nonmembers and their exports to nonmembers.

X_{ijt} = f (Y_{it}, Y_{jt}, N_{it}, N_{jt}, $LANG_{ij}$, ADJ_{ij}, DIS_{ij}, RER_{ijt}, TAF_{ijt}, $RTA2k_{ijt}$, $RTAkimp_{ijt}$, $RTAkexp_{ijt}$) (4-1)

where

X_{ijt} is exports[29] from country i to country j in year t,

Y_{jt} is gross domestic product of country j in year t,

Y_{it} is gross domestic product of country i in year t,

N_{jt} is population size of country j in year t,

N_{it} is population size of country i in year t,

$LANG_{ij}$ is dummy variable for country i and country j that have a common language,

AGJ_{ij} is dummy variable for country i and country j that have a common border,

DIS_{ij} is distance between country i and country j,

RER_{ijt} is real exchange rate between country i and country j in year t,

$RTA2k_{ijt}$ is dummy variable for country i and j that are members of the same RTA *k* in year t. This variable represents intra-bloc trade regardless of the group under consideration. The positive coefficient for this variable indicates that the intra-bloc trade increase.

$RTAkimp_{ijt}$ is dummy variable for country i that is not member of the group *k* of which country j is a member in year t. This variable represents extra-bloc imports of the member countries of regional groups. A negative coefficient for this variable displays that member countries have switched to importing from members rather than non-members. This effect is referred to as 'import trade diversion (MTD).'

[29] Many gravity models estimate RTA effects using total bilateral trade flows as a dependent variable. However for a given pair of countries, with total bilateral trade one cannot distinguish between the impacts of RTA formation on exports from non-member to RTA members from that on exports from the RTA member to the non-member. Therefore, a constant level for the overall bilateral trade (exports and imports) may be the result of a reduction in imports from non-members and an increase in exports from RTAs to third countries. Therefore, using bilateral exports instead of total bilateral trade is crucial for the construction of a meaningful *RTAkimp* dummy and *RTAkexp* dummy (Cernat , 2001). In addition import data might be contaminated by the noise component of trade costs affected by movements in oil prices whereas export data are free of the volatility induced by transportation costs, thus giving us a clearer picture of global trade (Croce, Juan-Ramon, & Zhu, 2004).

$RTAkexp_{ijt}$ is a dummy variable for country i that is a member of the group *k* of which country j is not a member in year t. This variable represents extra-bloc exports of the member countries of regional groups. A negative coefficient for this variable indicates that the RTA has resulted in the member countries preferring to export to members rather than non-members. This effect is referred to as 'export trade diversion (XTD).'

RTA dummies equal one since the date of a country's entry into the RTA[30]. These three RTA variables will allow us to determine the trade creation and diversion effects imputable to the different groups and to see if they constitute building blocks or stumbling blocks to economic progress. Trotignon (2010) draws up a typology of trade creation and diversion and systematizes the summation of the three coefficients to all of the groups under examination as follows (Table 4-2 and Table 4-3):

Table 4-2: Typology of Trade Creation and Diversion

Designation	**Effect of Regional Grouping**
Intra-bloc trade creation (ITC)	Stimulating effect on trade between partners
Export trade creation (XTC)	Stimulating effect on exports to the rest of the world
Import trade creation (MTC)	Stimulating effect on imports from the rest of the world
Import trade diversion (MTD)	Imports from the rest of the world are replaced by intra-bloc trade
Export trade diversion (XTD)	Exports to the rest of the world are replaced by intra-bloc trade

Source: Trotignon (2010), table 3, pp241

[30] Since the number of members in some RTAs was not constant over the sample period and since some countries acceded at a later stage, we had included in the three RTA dummies the countries according to the year when they joined the agreement. According to Dee and Gali (2005), our RTA dummies are defined in *dynamic* form. In contrast, *antimonde* form takes a nonzero value for all the years in the sample, irrespective of when the RTA was formed. Dee and Gali (2005) compared between *dynamic* form and *antimonde* and they found that dynamic form play an important role in their trade creation and trade diversion results.

Table 4-3: Trade Creations / Trade Diversions and the Typology of Blocs

RTA2	RTAexp	RTAimp	Creation / Diversion	Building / Stumbling Bloc
+	+	+	ITC, XTC and MTC	Building block
+	+	-	If RTA2> |RTAimp|: ITC, XTC, MTD If |RTAimp | > RTA2: XTC, MTD	Building block if $d_X >$ $\|d_M\|$ or stumbling block if $\|d_M\| > d_X$
+	-	+	If RTA2> |RTAexp|: ITC, XTC, MTD If |RTAexp| > RTA2: XTD, MTC	Building block if $d_M >$ $\|d_X\|$ or stumbling block if $\|d_X\| > d_M$
+	-	-	If RTA2> |RTAexp + RTAimp|: ITC, XTD, MTD If |RTAexp + RTAimp| > RTA2: XTD and/or MTD	Stumbling block

Source: Trotignon (2010), table 4, pp242

Table 4-2 shows the designation of each case of creation and diversion to the corresponding trade effects. Table 4-3 interprets the respective signs and values of the intra-bloc (RTA2) and extra-bloc (RTAexp and RTAimp) coefficients. Again note that the definitions of the terms 'import trade diversion' and 'export trade diversion[31]', refer to the definitions in Johnson (1962, p.53) and Endoh (1999), respectively. These definitions differ from those given by Viner (1950, p.43). Thus, it is not possible to conclude that economic welfare of RTA members has increased based on the fact that estimates from the gravity model indicate that RTA has led to an increase in trade among its members.

Now we provide a survey of the recent literature that is comparable with our research (Table 4-4). As regards the estimated intra-bloc trade creation, export trade creation/diversion, and import trade creation/diversion, the empirical literature could not reach any consensus. For instance the ASEAN trade bloc shows both intra-trade creation ((Endoh, 2000) (Carrère, 2004) (Elliott & lkemoto, 2004) and intra-trade diversion (Soloaga & Winters, 2001) (Tumbarello, 2007)).

[31] Endoh (1999) stated that this term had been introduced for the first time in his paper.

Table 4-4: A survey of the recent literature using three regional dummy variables

Study	Empirical Approach	Period / # of countries	RTAs and Results
Endoh (1999)	OLS	1960-1994	CMEA: RTA2=(+), RTAexp= (-), RTAimp= (-) EEC: RTA2= (+), RTAexp= (+), RTAimp= (+) LAFTA:RTA2= (-), RTAexp= (-), RTAimp = (-)
Endoh (2000)	OLS	1995	ASEAN: RTA2 = (+), RTAexp= (+), RTAimp = (+) APEC EAEC RTA2 = (+), RTAexp= (+), RTAimp = (+)
Soloaga & Winters (2001)	Tobit	1980-1996 / 58 countries	ANDEAN: RTA2=(+), RTAexp=(-), RTAimp=(-) ASEAN: RTA2 =(-), RTAexp=(+), RTAimp=(+) CACM: RTA2 =(+), RTAexp=(-), RTAimp=(-) EU: RTA2=(-), RTAexp=(+), RTAimp=(+) EFTA: RTA2=(n), RTAexp=(+), RTAimp=(+) GULFCOOP: RTA2=(+), RTAexp (-), RTAimp=(n) LAIA: RTA2= (+), RTAexp=(-), RTAimp=(-) MERCOSUR:RTA2=(+), RTAexp=(n), RTAimp=(-) NAFTA: RTA2=(n), RTAexp=(n), RTAimp=(+)
Carrere (2004)	Hausman-Taylor	1962-1996	ANDEAN: RTA2=(+), RTAexp=(-), RTAimp (-) MERCOSUR:RTA2=(+), RTAexp=(+), RTAimp=(-) ASEAN: RTA2=(+), RTAexp=(+), RTAimp = (+) CEMAC: RTA2=(+), RTAexp=(-), RTAimp=(-) UEMOA: RTA2=(+), RTAexp=(-), RTAimp=(-) ECOWAS: RTA2=(+), RTAexp=(-), RTAimp=(+) SADC: RTA2=(+), RTAexp=(+), RTAimp=(-) COMESA: RTA2=(n), RTAexp=(-), RTAimp=(n)
Croce, Juan-Ramon and Zhu (2004)	Nonlinear	1978-2001 / 64 countries	ANDEAN: RTA2=(n), RTAexp=(+), RTAimp=(n) CACM : RTA2=(n), RTAexp (n), RTAimp=(-) MERCOSUR:RTA2=(+), RTAexp=(-), RTAimp=(-) NAFTA : RTA2= (+), RTAexp=(-), RTAimp=(-)
Elliott & lkemoto (2004)		1982-1999	ASEAN RTA2 =(+), RTAexp=(+), RTAimp=(+) EU: RTA2=(+), RTAexp=(+), RTAimp=(+) NAFTA: RTA2=(+), RTAexp= (-), RTAimp = (-)
Kien & Hashimoto (2005)	Hausman-Taylor	1988-2002 / 39 countries	AFTA: RTA2=(+), RTAexp=(+), RTAimp=(+) EU: RTA2=(-), RTAexp=(n), RTAimp=(-) MERCOSUR:RTA2=(+), RTAexp =(-),RTAimp=(+) NAFTA: RTA2=(+), RTAexp=(-), RTAimp=(+)
Tumbarello (2007)		1984-2005 / 182 countries	ASEAN: RTA2 =(-), RTAexp=(+), RTAimp=(+) APEC: RTA2=(+), RTAexp=(+), RTAimp=(+) CER: RTA2=(+), RTAexp=(+), RTAimp=(-) EU-15: RTA2=(-), RTAexp=(+), RTAimp=(+) EAEC: RTA2=(n), RTAexp=(+), RTAimp=(-) MERCOSUR:RTA2=(+), RTAexp=(+), RTAimp=(-) NAFTA: RTA2=(n), RTAexp=(-), RTAimp=(n) SAPTA: RTA2=(n), RTAexp=(+), RTAimp=(+)

d_2 = intra trade, d_X = export-extra trade, d_M = import-extra trade, (+) = positive and statistically significant, (-) = negative and statistically significant, (n) = not significant.

AFTA = ASEAN Free Trade Area, ANDEAN = ANDEAN Pact, ASEAN = the Association of Southeast Asian Nation, APEC = the Asia Pacific Economic Cooperation, CACM = the Central American Common Market, CEMAC = the Economic and Monetary Community of Central Africa, CER = the Australia-New Zealand Closer Economic Relation, CMEA = the Council of Mutual Economic Assistance, COMESA = the Common Market for Eastern and Southern Africa,

EAEC = East Asia Economic Caucus, EEC = the European Economic Community, ECOWAS = the Economic Community of West African States, EFTA = the European Free Trade Association, EU-15 = the European Union-comprising 15 members, GULFCOOP = Gulf Cooperation Council, LAIA = the Latin American Integration Association, LAFTA = the Latin American Free Trade Association, MERCOSUR = the Southern Common Market, NAFTA = the North American Free Trade Agreement, SADC = the Southern African Development Community, SAPTA= the Agreement on South Asian Association for Regional Cooperation Preferential Trading Arrangement, UEMOA = the Economic and Monetary Union of West Africa,

The equation (4-1) comprising the three RTA variables will allow us to give an overall evaluation of the process of regional integration vis-à-vis multilateral trade. We estimate two types of specifications of equation (4-1). The first estimate includes three RTA dummy variables for 12 RTAs in a single regression in order to examine the effect of trade creation and the effect of trade diversion in the interdependent context with other FTAs in the world. The second estimates each RTA separately (12 separate regressions).

4.4 Data

4.4.1Trade Data: The World Integrated Trade Solution (WITS) – the World Bank.

4.4.2 Data of Regional Integration: The Regional Trade Agreements Information System (RTA-IS) – the World Trade Organization (WTO)

4.4.3 Data of Other Control Variables: The data on GDP, GDP per capita, and population size are from World Economic Outlook Database – IMF. Language data are from Wikipedia website (http://en .wikipedia.org/wiki). Data for tariffs is from United Nations TRANIS data, World Integrated Trade Solution (WITS) Database. Exchange rate is obtained from IFS-IMF. Note that ER is the exchange rate of the importer countries' currency measured by foreign currency per unit of domestic currency. Hence, an increase (decrease) in ER indicates appreciation (depreciation) of the domestic currency.

We report the summary statistics for all variables in table 4-5

Table 4-5: Summary Statistics

Definition	Mean	Std. Dev.	Min	Max
Exports in millions of $US.	201.7043	3,220.013	0	354,687
Importer Population (millions)	46.16.341	156.8944	0.041	1,328.02
Importer GDP of $US (billions)	207.8676	1,037.469	0.072	14,441
Exporter Population (millions)	36.35258	130.7271	0.04	1,328.02
Exporter GDP of $US (billions)	210.0203	909.7945	0.03	14,441
Importer's Tariff	14.5904	11.35392	0	106.5
Importer's Exchange Rate (Nati. per $US)	0.46887	1.601	0	30.694
Distance	8,084.103	4,469.764	10.478	19,904.45
Contiguity	0.0184	0.1344	0	1
Language	0.1608	0.3673	0	1
AFTA2	0.0029	0.0542	0	1
AFTA_imp	0.0547	0.2274	0	1
AFTA_exp	0.0457	0.2090	0	1
ADEAN2	0.0009	0.0308	0	1
ADEAN_imp	0.0370	0.1888	0	1
ADEAN_exp	0.0271	0.1624	0	1
CEMAC2	0.0004	0.0198	0	1
CEMAC_imp	0.0150	0.1216	0	1
CEMAC_exp	0.0176	0.1317	0	1
CIS2	0.0024	0.0486	0	1
CIS_imp	0.0359	0.1859	0	1
CIS_exp	0.0510	0.2200	0	1
EAC2	0.0005	0.0225	0	1
EAC_imp	0.0202	0.1406	0	1
EAC_exp	0.0155	0.1236	0	1
ECOWAS2	0.0068	0.0824	0	1
ECOWAS_imp	0.0799	0.2712	0	1
ECOWAS_exp	0.0621	0.2413	0	1
GCC2	0.0004	0.0211	0	1
GCC_imp	0.0141	0.1177	0	1
GCC_exp	0.0114	0.1059	0	1
MERCOSUR2	0.0005	0.0233	0	1
MERCOSUR_imp	0.0285	0.1664	0	1
MERCOSUR_exp	0.0205	0.1419	0	1
PAFTA2	0.00566	0.0750	0	1
PAFTA_imp	0.05813	0.2339	0	1
PAFTA_exp	0.05406	0.2261	0	1
SADC2	0.00212	0.0460	0	1
SADC_imp	0.03600	0.1863	0	1
SADC_exp	0.02507	0.1563	0	1
SAPTA2	0.00125	0.0353	0	1
SAPTA_imp	0.03800	0.1912	0	1
SAPTA_exp	0.02647	0.1605	0	1
WAEMU2	0.00128	0.0358	0	1
WAEMU_imp	0.03289	0.1783	0	1
WAEMU_exp	0.02115	0.1439	0	1
Number of OBS.	315,742			

4.5 Results and Discussion

The results of the thirteen estimates are presented in Table 4-6. The first regression includes all 12 RTAs in a single pooled regression. The rest of the regression considers each RTA separately. Since there appear to be missing observations of many control variables, this provides an unbalanced panel. In the pooled estimation there are 315,742 observations containing 165 exporters and 158 importers over the period 1981-2008.

The model explains a high proportion –94 percent – of the total variation of world exports in the single pooled regression and – between 79 to 96 percent in the each RTA separated regression. Most of the basic variables of the gravity model – the level of GDP of exporter and importer, importer's tariff, importer's exchange rate, distance, contiguity and language—have the expected sign and are statistically significant. The coefficients of population for exporter and importer are mixed. The coefficient on exporter GDP and importer GDP for example, is generally between 0.4 and 0.7, suggesting that trade increases as economic capacity grows. Distance variables and common border variable always show the traditional negative sign and a positive sign, respectively.

The PPML result suggests that during 1981-2008, RTA regimes had not brought the same impacts in every regional trade grouping. Also PPML shows a different outcome for the pooled regression and individual regressions. This study focuses on the result from pooled regression because it examines the interrelationship among RTAs that allows comparing the trade impact of these RTAs. Also the result for the pooled regression on average has a lower standard error compared to the results for individual regressions.

4.5.1 AFTA (ASEAN Free Trade Area)

Two dummies; AFTA2 and AFTA_imp are positive and statistically significant. This means that countries located within these regions give rise to intra-bloc trade creation and import trade

creation. Results show that the intra-regional trade for AFTA has increased to a higher level of 0.53. This means that AFTA members have trade with each other that is about 69[32] percent higher than without AFTA. This result shows that even though this study includes ASEAN new-comers Cambodia, Lao P.D.R., Myanmar, and Vietnam, AFTA still fostered trade flows among members. These new-comer members still have MFN tariff rates above those of other AFTA members and they have a low trade share in the region.

A positive sign for the AFTA_imp variable suggests that AFTA members have not diverted their imports from non-members to members. One plausible explanation for this is the fact that AFTA members followed a long period of multilateral trade liberalization during the 1980s and 1990s. In other words regional integration efforts proceeded in parallel with multilateral liberalization.

4.5.2 ANDEAN (Andean Community)

The RTA among the five countries (i.e., Bolivia, Columbia, Ecuador, Peru and Venezuela) seems to have not significantly changed the trade pattern of their members during 1981-2008. This can be seen from the insignificant coefficient of the ANDEAN2 and ANDEAN_exp. Only ANDEAN_imp dummy is significant and negative. This implies import trade diversion.

4.5.3 CEMAC (Economic and Monetary Community of Central Africa)

Only CEMAC_imp dummy is significant in this RTA. This implies that CEMAC is associated with import trade diversion. However, the CEMAC2-dummy is not significant in the pooled regression but is negative and significant in the CEMAC individual regression. This implies that under CEMAC there has been intra-trade diversion.

4.5.4 CIS (Commonwealth of Independent States)

The results suggest that CIS is associated with intra-bloc trade creation, export trade diversion and import trade diversion. PPML shows that the intra-regional trade has increased about 100 percent. On the other hand, the results suggest that CIS members have preferred imports from their members and exports to their members. On balance, the sum of the coefficients of three

[32] $[(e^{0.53}-1)*100\%]$

dummy variables (1.008 + (-0.454) + (-0.416)) is equal to 0.138. This implies that CIS tends to generate more trade among its members than any non-CIS random country pairs. In sum, the results place CIS as a stumbling block to multilateral trade integration.

4.5.5 EAC (East African Community)

The results show that the EAC is related to intra-bloc trade creation, export trade diversion and import trade diversion. The EAC agreement seems to have increased trade among its members around 226 percent. This is shown by the positive and significant coefficient of the EAC2-dummy. However EAC_import and EAC_export dummy are negative and significant. On balance, the sum of the coefficients of three dummy variable (2.267 + (-0.421) + (-0.445)) is equaled to 1.401. This indicates that EAC seems to have more intra-trade flows among its members than non EAC random country pairs. In sum the results identify EAC as favorable to trade regionalization.

4.5.6 ECOWAS (Economic Community of West Africa)

The results indicate that ECOWAS displays intra-bloc trade creation and import trade diversion. If two countries are the members of ECOWAS, trade between them is 128 percent more than without ECOWAS. Also ECOWAS appears to have 15.6 percent more imports among its members than without ECOWAS. These results are similar to those of Carrere (2004) who studied the period 1962-1996.

4.5.7 GCC (Gulf Cooperation Council)

GCC appears to have intra-bloc trade diversion and import trade creation. If two countries are members of GCC, then trade flows between them average 112 percent less than two similar countries. However the coefficient of GCC_imp dummy can be interpreted to mean that the GCC agreement increases imports between its members and the rest of the world by approximately 16.5 percent. Our result is consistent with Al-Atrash and Yousef (2000). They presented evidence that membership in GCC does not increase trade among member countries.

4.5.8 MERCOSUR (Southern Common Market)

The results indicate intra-bloc trade creation and import trade diversion. If two countries are members of MERCOSUR, then trade flows between them average 68 percent higher than two similar countries. On the other hand, the coefficient of MERCOSUR_imp dummy can be interpreted to mean that the MERCOSUR decreases imports between its members and the rest of the world by about 45 percent. Our result is consistent with Soloaga and Winters (2001) and Croce, Juan-Ramon and Zhu (2004). They also found that trade integration and trade diversion went hand in hand in MERCOSUR.

4.5.9 PAFTA (Pan-Arab Free Trade Area)

PAFTA appears to have intra-trade diversion and export trade creation. PPML indicates that if two countries are members of PAFTA, then trade flows between them are 42 percent lower than two similar countries.

4.5.10 SADC (Southern Africa Development Community)

SADC is the only RTA in this sample with three dummies (SADC2, SADC_exp and SADC_imp) that are positive and statistically significant in the pooled regression. This means that countries located within this region give rise to intra-bloc trade creation, import trade creation and export trade creation. The result shows that SADC members have traded with each other about 208 percent higher than without the RTA.

In sum, PPML places SADC as a building block, favorable to both regional integration and globalization.

4.5.11 SAPTA (Southern Asian Preferential Trade Agreement)

The result is associated with intra-bloc trade diversion and import trade diversion. SAPTA does not seem to have fostered trade flows among members to any greater extent than trade with nonmembers. PPML indicates that the intra-regional trade for SAPTA has decreased to a lower level of 0.55, implying that SAPTA members have traded with each other about 42 percent less than the level predicted in the benchmark context. Also SAPTA membership appears to have

been associated with import trade diversion. This can be seen from the negative coefficient of the SAPTA_imp dummy. Our result is consistent with the World Bank (2004) report on South Asia's trade. It argued that an RTA in South Asia would lead to substantial trade diversion rather than trade creation and considers an RTA in the region as a stumbling bloc to multilateral trade liberalization.

The World Bank report (2004) provided the reasons for the minimal impact during the earlier years of the SAPTA as follow: (a) the extreme reluctance to make any meaningful concessions in the earlier years. (b) The political problems between India and Pakistan exemplified by Pakistan's short list of products that can be imported from India. This relationship has hamstrung SAPTA and led all the South Asian countries to look for bilateral trade agreements with each other. (c) India's import licensing system which continued to effectively ban imports of all consumer goods from all destinations. The ban was lifted for the SAPTA countries only in 1998. It finally disappeared for the rest of the world in April 2010. (d) The controls of India's agricultural parastatals over imports and exports of major primary commodities.

4.5.12 WAEMU (West Africa Economic and Monetary Union)

In the case of the MAEMU PPML identified only intra-bloc trade diversion. PPML indicates that the intra-regional trade for MAEMU has decreased to a lower level of 1.66, implying that SAPTA members have traded with each other about 81 percent lower the level predicted in the benchmark context.

Table 4-6: Intra and Extra-bloc Effects of Trade Agreement

	All	AFTA	CAN	CEMAC	CIS	EAC
Exporter GDP	0.782*** (0.0506)	0.585*** (0.0577)	0.657*** (0.0850)	0.854*** (0.100)	0.076 (0.0732)	0.460*** (0.0126)
Importer GDP	0.796** (0.00967)	0.798*** (0.0715)	0.971*** (0.0822)	0.938*** (0.101)	0.337*** (0.0758)	0.449*** (0.0201)
Exporter Pop.	-0.0118*** (0.0437)	-0.147 (0.0854)	2.330*** (0.3331)	3.123*** (0.780)	0.781 (0.442)	1.133*** (0.0276)
Importer Pop.	0.0376** (0.0116)	-0.230*** (0.0516)	-0.0689 (0.1043)	0.327 (0.266)	0.219** (0.0736)	0.276 (0.0697)
Importer Tariff	-0.0847*** (0.0177)	-0.235*** (0.0455)	-0.180** (0.0684)	-0.0245 (0.147)	-0.141** (0.0476)	0.0407 (0.0151)
Exchange Rate	0.00929 (0.00490)	-0.0895* (0.0379)	-0.00431 (0.0091)	-0.0464 (0.0248)	0.0314 (0.0333)	-0.0611*** (0.00361)
Distance	-0.644*** (0.0115)	-0.711*** (0.0292)	-1.717*** (0.0910)	0.257 (0.202)	-0.791*** (0.0559)	-2.883*** (0.0352)
Contiguity	0.855*** (0.0318)	-0.0159 (0.0512)	0.120 (0.1195)	4.213*** (0.330)	0.255*** (0.0670)	-0.196 (0.0267)
Language	0.561*** (0.0220)	0.133*** (0.0358)	0.542* (0.2734)	-0.280** (0.108)	0.819*** (0.0979)	0.0269 (0.0106)
AFTA2	0.529*** (0.0793)	0.733*** (0.166)				
AFTA_exp	0.0214 (0.0647)	0.591*** (0.153)				
AFTA_imp	0.758*** (0.0352)	0.389* (0.157)				
ADEAN2	0.363 (0.209)		0.567* (0.2679)			
ADEAN_exp	0.0211 (0.204)		0.295* (0.2679)			
ADEAN_imp	-0.497*** (0.0271)		0.264 (0.1357)			
CEMAC2	-0.608 (0.355)			-2.116*** (0.382)		
CEMAC_exp	0.279 (0.174)			-1.245*** (0.248)		
CEMAC_imp	-0.533*** (0.0811)			-0.885*** (0.183)		
CIS2	1.008*** (0.172)				2.258*** (0.438)	
CIS_exp	-0.454** (0.158)				1.219*** (0.224)	
CIS_imp	-0.416*** (0.0546)				1.288*** (0.227)	
EAC2	2.267*** (0.154)					0.508* (0.0331)
EAC_exp	-0.421** (0.135)					0.361* (0.0307)
EAC_imp	-0.445*** (0.0560)					0.420** (0.0280)

Standard errors in parentheses *p<0.05 **p<0.01 ***p<0.001

Table 4-6: Intra and Extra-bloc Effects of Trade Agreement (Cont.2/3)

	All	ECOWAS	GCC	MERCOSUR	PAFTA	SADC
Exporter GDP		0.632***	0.599***	0.456***	0.568***	0.537***
		(0.0754)	(0.898)	(0.0545)	(0.0692)	(0.122)
Importer GDP		0.608***	1.163***	0.932***	1.152***	0.711***
		(0.0417)	(0.503)	(0.029)	(0.0303)	(0.159)
Exporter Pop.		1.273***	0.302	0.631**	0.0718	0.653
		(0.274)	(0.192)	(0.222)	(0.121)	(0.438)
Importer Pop.		0.291***	-0.113*	-0.253***	-0.399***	-0.728
		(0.0684)	(0.057)	(0.0371)	(0.0322)	(0.419)
Importer Tariff		0.00987	0.269***	0.163***	0.139***	0.125
		(0.0860)	(0.046)	(0.0438)	(0.0405)	(0.0693)
Exchange Rate		-0.0573***	-0.297***	-0.012	-0.178***	0.0152
		(0.0156)	(0.043)	(0.0112)	(0.0243)	(0.0125)
Distance		-0.0922	-1.338***	-0.470***	-1.096***	-0.481***
		(0.0592)	(0.066)	(0.0265)	(0.0295)	(0.122)
Contiguity		0.888***	-0.447***	0.453***	-0.699***	1.606***
		(0.117)	(0.095)	(0.0818)	(0.0775)	(0.176)
Language		1.166***	0.353***	0.107*	0.344***	0.307**
		(0.0495)	(0.067)	(0.0518)	(0.0438)	(0.114)
ECOWAS2	1.284***	1.713***				
	(0.208)	(0.206)				
ECOWAS_exp	0.0989	0.618				
	(0.191)	(0.735)				
ECOWAS_imp	-0.156**	0.172				
	(0.0535)	(0.105)				
GCC2	-1.120***		-0.823***			
	(0.132)		(0.160)			
GCC_exp	0.0925		0.203			
	(0.0977)		(0.135)			
GCC_imp	0.165**		-0.352***			
	(0.0558)		(0.101)			
MERCOSUR2	0.685***			0.961***		
	(0.0962)			(0.107)		
MERCOSUR_exp	0.0448			0.294**		
	(0.0679)			(0.0999)		
MERCOSUR_imp	-0.452***			0.583***		
	(0.0583)			(0.0935)		
PAFTA2	-0.421***				-0.271*	
	(0.0937)				(0.122)	
PAFTA_exp	0.258**				0.548***	
	(0.0928)				(0.108)	
PAFTA_imp	0.0491				0.0346	
	(0.0351)				(0.0988)	
SADC2	2.087***					0.413
	(0.180)					(0.219)
SADC_exp	0.717***					0.601***
	(0.132)					(0.172)
SADC_imp	0.130*					-0.0122
	(0.0618)					(0.153)

Standard errors in parentheses *p<0.05 **p<0.01 ***p<0.001

Table 4-6: Intra and Extra-bloc Effects of Trade Agreement (Cont.3/3)

	All	AFTA	CAN	CEMAC	CIS	EAC	ECOWAS	GCC	MERCOSUR	PAFTA	SADC	SAPTA	WAEMU
Exporter GDP												0.774***	0.762***
												(0.0592)	(0.161)
Importer GDP												0.824***	0.565***
												(0.121)	(0.0676)
Exporter Pop.												-0.203*	1.043**
												(0.0947)	(0.357)
Importer Pop.												0.236	-0.114
												(0.186)	(0.0664)
Importer Tariff												-0.20***	-0.13*
												(0.0603)	(0.0601)
Exchange Rate												-0.115**	-0.265***
												(0.0359)	(0.0422)
Distance												-1.067***	-0.0907
												(0.0306)	(0.0705)
Contiguity												-0.322***	0.914***
												(0.0838)	(0.135)
Language												-0.479***	0.599***
												(0.0661)	(0.107)
SAPTA2	-0.555**											-0.270**	
	(0.174)											(0.0892)	
SAPTA_exp	0.0866											0.396***	
	(0.0796)											(0.0739)	
SAPTA_imp	-0.601***											-0.0851	
	(0.0435)											(0.0549)	
WAEMU2	-1.668***												1.883***
	(0.162)												(0.226)
WAEMU_exp	-0.0839												0.779***
	(0.114)												(0.187)
WAEMU_imp	-0.0893												1.239***
	(0.0717)												(0.165)
Constant	2.226***	4.455***	-0.246	-24.30***	0.743	15.26***	-10.28***	4.782***	-2.241	5.993***	-3.184	4.955***	-10.23***
	(0.233)	(0.704)	(1.688)	(4.610)	(2.191)	(0.478)	(1.470)	(0.961)	(1.230)	(0.629)	(3.167)	()	(1.930)
All regressions include exporter fixed effect, importer fixed effect and time fixed.													
N	315,742	36,243	23,816	18,853	30,068	24,261	59,732	26,584	18,306	68,897	50,106	63,131	35,925
Pseudo R-sq	0.941	0.960	0.949	0.877	0.953	0.877	0.888	0.923	0.963	0.880	0.882	0.936	0.798

Standard errors in parentheses *p<0.05 **p<0.01 ***p<0.001

4.6 Conclusion

Using a modified gravity equation, this chapter investigates the effects of RTAs on world and regional trade patterns, concentrating on data for the 12 RTAs covering 1981-2008. The effects of RTAs are captured by dummies that reflect intra-bloc trade and import extra-bloc trade and export extra-bloc trade separately. Our first main finding is that not all of the RTAs succeed in giving rise to intra-bloc trade creation. Some RTAs namely SAPTA, GCC, PAFTA, and WAEMU are found to have negative intra-bloc effects. Our second finding is that of these 12 RTAs in the sample, 7 show import trade diversion while most of the export extra-bloc trade dummies are not statistically significant. The third finding is that three of five African RTAs in the sample have generated intra-bloc trade. Next, our finding is that the result for pooled regression and the result for individual regressions are different. Finally our result confirms that the basic variables of the gravity model show expected sign with high statistical significance (Table 4-7).

Table 4-7: Summary of regression results

Region	RTA	Type	Regression Results
South East Asia	AFTA	FTA	RTA_2= (+), RTA_{exp}= (n), RTA_{imp}= (+)
South-Asia	SAPTA	PTA	RTA_2= (-), RTA_{exp}= (n), RTA_{imp}= (-)
Western Hemisphere	ANDEAN	CU	RTA_2= (n), RTA_{exp}= (n), RTA_{imp}= (-)
Western Hemisphere	MERCOSUR	CU & EIA	RTA_2= (+), RTA_{exp}= (n), RTA_{imp}= (-)
Europe and Central Asian	CIS	FTA	RTA_2= (+), RTA_{exp}= (-), RTA_{imp}= (-)
Middle East	GCC	CU	RTA_2= (-), RTA_{exp}= (n), RTA_{imp}= (+)
Middle East & North Africa	PAFTA	FTA	RTA_2= (-), RTA_{exp}= (+), RTA_{imp}= (n)
Sub-Saharan African	CEMAC	CU	RTA_2= (n), RTA_{exp}= (n), RTA_{imp}= (-)
Sub-Saharan African	EAC	CU	RTA_2= (+), RTA_{exp}= (-), RTA_{imp}= (-)
Sub-Saharan African	ECOWAS	CU	RTA_2= (+), RTA_{exp}= (n), RTA_{imp}= (-)
Sub-Saharan African	SADC	FTA	RTA_2= (+), RTA_{exp}= (+), RTA_{imp}= (+)
Sub-Saharan African	WAEMU	CU	RTA_2= (-), RTA_{exp}= (n), RTA_{imp}= (n)

Source: Authors' results

4.7 Appendix

Table A4-1: 12 Developing RTAs

AFTA (ASEAN Free Trade Agreement)	ANDEAN (Andean Community)	CEMAC (Economic and Monetary Community of Central Africa)
Brunei Draussalam (1992)	Bolivia (1988)	Cameroon (1999)
Indonesia (1992)	Columbia (1988)	Central of African Rep. (1999)
Malaysia (1992)	Ecuador (1988)	Chad (1999)
Philippines (1992)	Peru (1988)	Congo, Republic of (1999)
Singapore (1992)	Venezuela (1988)	Equatorial Guinea (1999)
Thailand (1992)		Gabon (1999)
Vietnam (1995)		
Laos (1997)		
Myanmar (1997)		
Cambodia (1999)		
CIS (Commonwealth of Independent States)	EAC (East African Community)	ECOWAS (Economic Community of West Africa)
Armenia (1995)	Burundi (2000)	Benin (1993)
Azerbaijan (1995)	Kenya (2000)	Burkina Faso (1993)
Belarus (1995)	Rwanda (2000)	Cape Verde (1993)
Georgia (1995)	Tanzania (2000)	Côte d'Ivoire (1993)
Kazakhstan (1995)	Uganda (2000)	Gambia (1993)
Kyrgyz Republic (1995)		Ghana (1993)
Moldova (1995)		Guinea (1993)
Russia (1995)		Guinea-Bissau (1993)
Tajikistan (1995)		Liberia (1993)
Ukraine (1995)		Mali (1993)
Uzbekistan (1995)		Niger (1993)
		Nigeria (1993)
		Senegal (1993)
		Sierra Leone (1993)
		Togo (1993)

Source: World Trade Organization

Table A4-1: 12 Developing RTAs (Cont.)

GCC (Gulf Cooperation Council)	MERCOSUR (Southern Common Market)	PAFTA (Pan-Arab Free Trade Area)
Bahrain (2003)	Argentina (1991) (Dummy 1992)	Algeria (1998)
Kuwait (2003)	Brazil (1991)	Bahrain (1998)
Oman (2003)	Paraguay (1991)	Egypt (1998)
Qatar (2003)	Uruguay (1991)	Iraq (1998)
Saudi Arabia (2003)		Jordan (1998)
United Arab Emirates (2003)		Kuwait (1998)
		Lebanon (1998)
		Libya (1998)
		Morocco (1998)
		Oman (1998)
		Qatar (1998)
		Saudi Arabia (1998)
		Syrian Arab Republic (1998)
		Tunisia (1998)
		United Arab Emirates (1998)
SADC (Southern Africa Development Community)	SAPTA (Southern Asian Preferential Trade Agreement)	WAEMU (West Africa Economic and Monetary Union)
Angola (2000) (Dummy 2001)	Bangladesh (1995) (Dummy 1996)	Benin (2000)
Botswana (2000)	Bhutan (1995)	Burkina Faso (2000)
Congo, Dem.Rep.of (2000)	India (1995)	Côte d'Ivoire (2000)
Lesotho (2000)	Maldives (1995)	Guinea – Bissau (2000)
Madagascar (2004)	Nepal (1995)	Mali (2000)
Malawi (2000)	Pakistan (1995)	Niger (2000)
Mauritius (2000)	Sri Lanka (1995)	Senegal (2000)
Mozambique (2000)		Togo (2000)
Seychelles (2001-2004, 2008)		
South Africa (2000)		
Swaziland (2000)		
Tanzania (2000)		
Zambia (2000)		
Zimbabwe (2000)		

Source: World Trade Organization

Chapter 5

Institutional Determinants of Foreign Direct Investment in ASEAN

5.1 Introduction

Foreign direct investment (FDI) inflows have grown faster than world income since the 1960s and have risen much faster than world trade since the mid 1970s. Over the last couple of decades worldwide FDI flows have increased by a factor of almost 10 while trade flows around the world only doubled during a similar period. World FDI inflows have about tripled from $341 billion in 1995 to $973 billion in 2005 and world FDI inflows peaked at $1.38 trillion in 2000. These flows have been concentrated in the developed countries which have accounted for more than 60 percent of global FDI inflows, with the exception of 2004 when their share was 56 percent (Table 5-1).

Among the developing countries, ASEAN[33] has been an important recipient of FDI. As a percentage of World FDI, ASEAN in-flows jump from 1.7 percent in 2000 to 4.1 percent in 2005 but these flows have dropped from their highs in 1995 when ASEAN accounted for about 8.3 percent of world inflows[34]. ASEAN is also one of the few developing-country areas that reports bilateral FDI flows that constitute the dependent variable in this study.

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[33] The Association of Southeast Asian Nations (ASEAN) was founded in 1967. The five original members in 1976 – Indonesia, Malaysia, the Philippines, Singapore, and Thailand – welcomed Brunei in 1984, Vietnam in 1995, Laos and Myanmar in 1997, and Cambodia in 1999. ASEAN started implementing intra-regional economic cooperation in 1976. In terms of an ASEAN economic integration, there are three pillars namely the ASEAN Free Trade Area (AFTA), the ASEAN Investment Area (AIA) and the ASEAN Framework Agreements on Services (AFAS). ASEAN are widely different from each other: ranging from land-locked, poor, rural Laos to the developed island city-state of Singapore. In 2009, the aggregate population was about 591 million growing at 1.2 percent annually. GDP for the region in 2009 was $1,499 billion, so per capita GDP was $2,533. But that masked extreme variation from about $419 in Myanmar to $36,631.2 in Singapore. (ASEAN Secretariat website, http://www.aseansec.org/19226.htm, accessed on January 01, 2011)

[34] One possible explanation is this downward trend might be related to the Asian crisis. This crisis began in Thailand with its currency crisis in 1997, which immediately had a great impact on other ASEAN countries. ASEAN countries faced serious problems including negative economic growth, demand decline and stagnant FDI. However this downward trend did not only affected ASEAN but also other region such as Africa, Central America, China and South Asia (Table 5-1).

Table 5-1: Percentage of world FDI inflows in developing countries by region (%)

Region	1995	1998	2000	2002	2004	2005
World (US$)	341,189	705,330	1,381,675	629,675	734,892	973,329
Total Developed Countries	64.8%	71.8%	80.9%	70.3%	56.4%	63.0%
Total Developing Countries	34.0%	27.6%	18.9%	28.9%	40.7%	32.3%
Africa[35]	1.7%	1.4%	0.7%	2.5%	3.0%	3.9%
South America[36]	5.5%	7.5%	4.2%	4.5%	5.1%	4.6%
Central America[37] (8)	3.0%	2.3%	1.5%	4.1%	3.7%	2.6%
Caribbean[38] (23)	0.2%	2.3%	1.5%	0.8%	4.2%	0.7%
China	10.6%	6.4%	2.9%	8.4%	8.3%	7.4%
Hong Kong + Korea +Taiwan	2.7%	2.8%	5.5%	2.3%	6.1%	4.3%
South Asia[39] (9)	0.8%	0.6%	0.4%	1.7%	1.4%	1.5%
ASEAN[40] (10)	8.3%	3.2%	1.7%	2.7%	4.8%	4.1%
South-East Europe & the Common wealth of Independent States[41] (20)	1.2%	1.1%	0.5%	1.8%	4.1%	3.2%

Source: UNCTAD (http://www.unctad.org/Templates/Page.asp?intItemID=3277&lang=1)
Note: Number in parenthesis is number of countries in each region

For ASEAN member countries, FDI remains one of the important keys to development. ASEAN sought the deepening of intra-ASEAN economic cooperation and integration to attract FDI. Signed in 1998, the ASEAN Investment Area (AIA) is a means of facilitating free flows of direct investment, technology and skilled labor. The AIA opened up to ASEAN investors in 2010 and is to be extended to all world investors by 2020. More recently, the AIA has been deepened through the ASEAN Comprehensive Investment Agreement (ACIA), which was implemented in 2007.

[35] Africa (56) : Algeria, Egypt, Libyan Arab Jamahiriya, Morocco, Sudan, Tunisia, Benin, Burkina Faso, Cape Verde, Côte d' Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Saint Helena, Senegal, Sierra Leone, Togo, Burundi, Cameroon, Central African Rep., Chad, Congo, Congo (Democratic Rep. of), Equatorial Guinea, Gabon, Rwanda, São Tomé and Principe, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Mauritius, Mayotte, Reunion, Seychelles, Somalia, Uganda, United Rep. of Tanzania, Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia, Zimbabwe.

[36] South America (14): Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Falkland Islands (Malvinas), French Guiana, Guyana, Paraguay, Peru, Suriname, Uruguay, Venezuela.

[37] Central America (8): Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama.

[38] Caribbean (23): Anguilla, Antigua & Barbuda, Aruba, Bahamas, Barbados, British Virgin Island, Cayman Islands, Cuba, Dominica, Dominica Rep., Grenada, Haiti, Jamaica, Martinique, Montserrat, Netherlands Antilles, Puerto Rico, St. Kitts & Nevis, St. Lucia, St. Vincent & the Grenadines, Trinidad & Tobago, Turks & Caicos Islands.

[39] South Asia (9): Afghanistan, Bangladesh, Bhutan, India, Iran, Maldives, Nepal, Pakistan, Sri Lanka.

[40] ASEAN (10): Brunei Darussalam, Cambodia, Indonesia, Lao, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor-Leste, Vietnam.

[41] South-East Europe & the Common wealth of Independent States: Albania, Bosnia-Herzegovina., Croatia, Macedonia Yugoslavia, Serbia & Montenegro, Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Moldova, Russian Fed., Tajikistan, Turkmenistan, Turkmenistan, Ukraine, Uzbekistan.

This agreement covers further steps towards liberalization, protection, facilitation and promotion of investments. Furthermore, it shortens the deadline to from 2020 to 2015 to achieve a free and open investment environment. The objective of ACIA is to boost FDI inflows as a means to foster economic growth through production and employment increases as well as spillover effects (Uttama & Peridy, 2009).

Recently the literature has focused on the effects of institutions on FDI. There are several reasons why the quality of institutions may matter for attracting FDI. One is rooted in the results of the productivity and growth literature. Recent empirical evidence tends to confirm that cross-country differences in growth and productivity are related to differences in institutions (Talbott & Roll, 2001). Good institutions may attract foreign investors. Another reason is based on studies by North. According to North (1987), the fundamental causes of economic growth are the institutions that lower transaction cost. Thus, poor institutions can bring additional transaction costs to FDI. A third reason is high sunk costs. The high sunk costs associated with investing offshore, along with weak enforcement of regulations and ineffective legal systems, has progressively forced multinational firms to be increasingly selective as to where they will invest (Mishra & Daly, 2007).

Given the importance of foreign investment for ASEAN economies and given the importance of institutions for attracting FDI, it is worthwhile studying the links between institutions and FDI. This chapter contributes to the existing literature in several ways. First, we examine the role of institutions in ASEAN over the period 1995 – 2005 by estimating a gravity equation for bilateral FDI flows. Second I follow Santo Sila and Tenreyro (2006) and use a Poisson model pseudo – maximum – likelihood (PPML) estimation technique. This estimation technique is robust to different patterns of heteroskedasticity and provides a natural way to deal with zeros in the data. Third the model incorporates more detail on institutions by using a new database constructed by the French Ministry of Finance network in 51 foreign countries including ASEAN-6.

The remainder of the paper is organized as follows. A brief review of the literature is presented in section 5.2. Section 5.3 presents the specification of the gravity model for FDI. Section 5.4 describes the data. Section 5.5 discusses the econometric specification for the gravity model generated by the occurrence of zero FDI flows. Section 6 presents the empirical results and section 7 concludes.

5.2 Review of Literature

Several recent studies have focused on the role of institutions in determining the location of FDI in this decade. Benassy-Quere et al. (2007) use data on bilateral FDI stocks from OECD countries and find that bureaucracy, low corruption, information, banking sector and legal institutions have a significant positive effect on FDI. They use the Institutional Profile database and the Fraser database on institutional variables. Mishra and Daly (2007) study the effect of the quality of institutions in the OECD and Asian host countries on outward FDI stocks of the OECD countries using the International Country Risk Guide database (ICRG). They find that legal systems, popular observance of law, strength and quality of bureaucracy and government stability in the host countries have an overall positive and significant effect on source countries' outward FDI stocks. Naude and Krugell (2007) use the World Bank database World Governance Indicators ((Kaufman, Kraay, & Zoido-Lobaton, 1999)) to study institutional effects on FDI in Africa. They find that political stability, accountability, regulatory burden and rule of law matter for FDI. Asiedu (2006) using the data from ICRG finds that good infrastructure promotes FDI in Africa. In contrast, corruption and political instability have the opposite effect. Aizenman and Mark M. Spiegel (2006) find that the share of FDI to gross fixed investment as well as the ratio of FDI to private domestic investment is negatively and significantly correlated with the level of corruption and FDI is more sensitive than domestic investment to the level of institutional quality. Globerman and Shapiro (2003) find that countries that fail to achieve a minimum threshold of effective governance are unlikely to receive any US FDI. They also find that given that a country is a

recipient of US FDI, governance infrastructure as well as the nature of the legal system is an important determinant of the amount received. Globerman and Shapiro (2002) use institutional data from the World Bank, UNDP and Environmental sustainability Index. Their results indicate that governance infrastructure is an important determinant of both FDI inflows and outflows. Stein and Daude (2002) use ICRG data find that inward FDI to be significantly influenced by political instability and violence, government effectiveness, regulatory burden, rule of law and graft.

All in all, recent evidence surveyed in Table 5-2 confirms a straightforward picture. The quality of institutions is an important determinant of FDI activity. This suggests that institutional changes in ASEAN may have influenced the variance of FDI in ASEAN[42]. The next section therefore applies a gravity model of FDI with institutional variables and refined empirical techniques to check whether a robust result can be obtained for ASEAN.

[42] It is surprising that there is a lack of research on the institutional determinants of FDI in ASEAN. A search of the EconLit database typing 'foreign direct investment' and 'ASEAN' and 'institutions' as keywords yielded zero journal articles the institutional determinants of FDI to ASEAN.

Table 5-2: Selected recent studies concerning institutions and FDI

Study	Empirical Approach	Sample	Data for Institution[43]	Other Control Variables[44]	Conclusion
Desbordes and Vicard (2009)	Poisson , OLS	OECD 1991-2000	ICRG, KEDS	GDPH, GDPS, GDPCAPH, GDPCAPS, DIST, LANG, BIT	Positive & sig. link b/w instit. & FDI
Benassy-Quere et al. (2007)	Three step precedure	OECD 1985-2000	IP and Fraser	GDPH, GDPS, GDPCAPH, DIST, Contiguity, LANG	Positive & sig. link b/w instit. & FDI
Mishra and Daly (2007)	2SLS	OECD 1991-2001	ICRG	SGDP, DIST, TRADE, ADIFSKILL	Positive & sig. link b/w instit. & FDI
Naude and Krugell (2007)	GMM	Africa 1970-1990	KKZL	Lag of (FDI/GDP)	Negative & Positive & Sig.
Asiedu (2006)	FE	Africa 22 countries 1984-2000	ICRG	NATEXP, GDP, INFLT, LIT, INFR, Political Risk	Positive & sig. link b/w instit. & FDI
Aizenman and Mark M. Spiegel (2006)	Weighted least squares	A cross country 1990-99	Business International's index	GDP, DISTUS, DISTGERM, SKILL, SKILLGDP, INVC, PROT	Positive & sig. link b/w instit. & FDI
Globerman and Shapiro (2003)	A two-stage estimation: 1st stage is probit and 2nd stage is OLS	A cross country 1995-1997	KKZL	RGDP, HDI, FIXUS, DEXR, PROX	Positive & sig. link b/w instit. & FDI
Globerman and Shapiro (2002)	OLS	A cross country 1995-97, FDI in. & FDI out.	KKZL, HDI, ESI	Lag GDP	Positive & sig. link b/w instit. & FDI
Stein and Daude (2002)	OLS, 2SLS & Robustness (Poisson, Tobit)	A cross country 2002 Outward FDI stock	KKZL, ICRG, WBEC	SGDP, SQDIFGDP, ADIFGDP*ADIFSKILL, ADIFSKILL, DIST, TARIFF, TARIFF*SQDIFSKILL	Positive & sig. link b/w instit. & FDI
Hausmann and Fernandez (2000)	OLS	A cross country 1996-98	KKLP, La Porta	GDPCAP, GDP, TRADE2	Positive & sig. link b/w instit. & FDI

[43] Business International's Index from the Tanzi and Davoodi (1997) (http://www.transparency.org/), ESI = Environment Sustainability Index by the World Economic Forum in conjunction w/ Columbia and Yale Universities, Fraser = the Fraser Institute database, HDI = UN Human Development Index by the United Nation, ICRG = International Country Risk Guide, IP =the Institutional Profiles database, KEDS = the Kansas Events Data System by Gary King (http://gking.harvard.edu.), KKZL = Kaufmann et al. (1999a, b), La Porta = the La Porta et al. (1997, 1998a, 1998b), WBEC = Business Environment Survey from the World Bank.

[44] ADIFGDP = the absolute difference b/w the host country and the source country GDPs, ADIFSKILL = the absolute difference b/w the countries' endowments of skilled labor, DEXR = Exchange rate change, DIST = the distance b/w the capital of the host country and the source country, DISTUS and DISTGER = the log of distance from the US and Germany, respectively, FIXUS =countries with fixed exchange rate dummy,GDPH and GDPS = the log of the host country GDP and the source country GDP, respectively, GDPCAPH and GDPCAPS = the log of the host country and the source country GDP per cap, INVC = investment costs and protectionism from Markusen and Maskus (2002) based on the World Competitiveness Report of the World Economic Forum, INFLT = Inflation, INFR = the # of telephone main lines per 1,000, LIT= the % of adults who are literate, NATEXP = the share of minerals & oil in total exports, PROX = a dummy that equals 1 if the country is contiguous with the US, Political Risk = Coups Assassinations and Revolutions from the *Cross-national Time Series Data Archive*, RGDP = real GDP, SGDP = the sum of the logs of the host country and the source country GDPs ($), SKILL = the ratio of skilled to unskilled labor in country i, SKILLGDP = the ratio of skilled labor w/ the size of the local economy, SQDIFGDP = the squared difference in the GDPs of the host and the source country, SQDIFSKILL = the squared difference b/w the countries' endowments of skilled labor, TRADEa = the ratio of trade to GDP, TRADEb = the ratio of export to GDP, TARIFF = average tariff

5.3 Gravity Model of FDI

The empirical specifications of this paper are based on Kleinert and Toubal's (2010) gravity model of FDI and based on Blonigen (2005)'s review of the empirical literature on FDI determinants. We add institutional variable (INST) into their models. The next two equations are the gravity model of FDI following Kleinert and Toubal's (2010) work. The further two equations are equation (5-1) and (5-2) that include Blonigen (2005) four variables.

Equation (5-1) gives the standard gravity equation for FDI as derived from the horizontal models[45].

$$FDI_{ijt} = \text{f}(Y_{it}, Y_{jt}, D_{ij}, INST_{jt}) \quad (5\text{-}1)$$

where subscript *i, j* and *t* denotes home country, host country and time, respectively. Y indicates GDP and D indicate distance between home and host country. The horizontal models predict the coefficients of the home and host country GDP to be one. The distance coefficient β is predicted to be negative. The regression model derived from the vertical model is given by

$$FDI_{ijt} = \text{f}(Y_{it}, Y_{jt}, D_{ij}, RFE_{ijt}, Y_{it} + Y_{jt}, INST_{jt}) \quad (5\text{-}2)$$

where $RFE_{ijt} = ((S_i/(S_i + S_j)) / (L_i/(L_i + L_j)))$, L denotes the factor price of low-skilled labor and S indicates the factor price of high-skilled labor. The vertical model predicts the coefficient ϑ of the sum of home and host countries GDP to be one, the coefficient ζ to be negative, and ξ to be positive. Additionally the distance coefficient β is predicted to be negative while the coefficient ν of the relative factor endowment RFE should be positive.

[45] Shatz and Venables (2000) distinguished between two main reasons why foreign direct investors would like to locate in a foreign country. The first one is to better serve the local market and is called 'horizontal' or 'market seeking' (market access motivation) since it implies a duplication of production plants. Here the main motivation is to economise on tariffs, transport costs and to tap a new market. FDI to establish a horizontal MNE is a substitute for international trade and is mainly driven by market size. The second reason is to have access to lower-cost inputs. This type of FDI is called 'vertical' or 'production cost-minimizing' (resource access motivation) since there is fragmentation. The motivation is to economise on production factors to maximize the profits on each part of the good production.

Blonigen (2005) reviews the empirical literature on FDI determinant and he concludes that exchange rate effects, taxes, institutions, trade protection, and trade effects matter for the firm's FDI decision. Thus, we include exchange rate (ER), trade openness (OP), average tariff (TARF), corporate income tax (TAX) into the equation (1) and equation (2), respectively.

$$FDI_{ijt} = \text{f}(Y_{it}, Y_{jt}, D_{ij}, INST_{jt}, ER_{jt}, OP_{jt}, TARF_{jt}, TAX_{jt}) \quad (5\text{-}3)$$

$$FDI_{ijt} = \text{f}(Y_{it}, Y_{jt}, D_{ij}, RFE_{ijt}, Y_{it} + Y_{jt}, INST_{jt}, ER_{jt}, OP_{jt}, TARF_{jt}, TAX_{jt}) \quad (5\text{-}4)$$

Accordingly, we use equation (5-3) and (5-4) to study the influence of institutions of FDI in ASEAN. Given the high degree of correlation among the institutional variables, we include them in the regressions one at a time in order to avoid problems of multicollinearity. The details of institutional variables are shown in the next section.

5.4 Data

5.4.1 FDI Data

We use bilateral FDI inflows into ASEAN countries from the Statistics of Foreign Direct Investment in ASEAN, Eighth Edition, (2006) covering the period from 1995 to 2005. To our knowledge, this is the only database that covers bilateral FDI inflows to all ASEAN countries and one of the few such databases extant among developing-country groups. The dataset covers 39 source (home) countries[46] and 9 host countries[47] which include all ASEAN members. Since some host countries namely Brunei Darussalam, Cambodia, and Lao PDR have not data on many control variable, this study can cover only ASEAN6, namely; Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam. There also are the negative divestment figures (352 observations). We treat them as zero observations. Thus, forty-two percent of the bilateral dependent-variable observations are zero FDI inflows.

5.4.2 Institutional Data

In order to assess the role of institutions as a determinant of the amount and the location of FDI, we primarily use a database called Institutional Profiles that describes both formal and informal institutions at a highly detailed level. The database was built by researchers from the French Ministry for the Economy, Industry and Employment (MINEIE), and the French Development Agency (AFD) and was constructed from a world survey conducted with MINEIE and AFD agencies present in the countries covered in the database.

A total of 356 questions were asked concerning public institutions, good and services, capital markets, and labor markets. In each case, a set of questions were asked covering nine institutional

[46] Source (Home) countries are Japan, USA, Canada, Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom, China, India, Pakistan, Republic of Korea, Hong Kong, Taiwan (China), Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, the Philippines, Singapore, Thailand, Vietnam, Australia, New Zealand, Argentina, Brazil, Mexico, Panama.

[47] Host countries are Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, the Philippines, Singapore, Thailand, Vietnam

functions namely: (1) political institutions, (2) safety, law and order, (3) public governance, (4) market freedom, (5) investment on future, (6) ability to reform, (7) security of transaction and contracts, (8) regulation, and (9) openness and social cohesion. The responses to each question ranked 0, 1, 2, 3 and 4. Higher values indicate better institutions (0 very bad to 4 very good) (Meisel & Aoudia, 2007). Table 5-3 shows the structure of the institutional field.

We access the Institutional Profiles Database (IPD) from the Centre D' etudes Prospective Et D' information Internationals (CEPII). The IPD is based on a survey conducted in 2001 and in 2006. The 2001 IPD covered 51 countries and 2006 IPD extended to 85 countries (including the 51 countries in the 2001 IPD). Both IPD included ASEAN countries. We use 2001 IPD for FDI over the period 1995-2000 and use 2006 IPD for FDI over the period 2001-2005[48].

[48] http://www.cepii.fr/anglaisgraph/bdd/institutions.htm

Table 5-3: A summary of the database and its structure in 4 sectors and 9 themes

Institutional themes in the columns	Institutional environment	Markets		
Institutional themes in the row	-A- Public institutions, Civil society	-B- Good and services	-C- Capital market	-D- Labor markets and social relations
1. Political institutions	Public rights and liberties			Trade union freedom and pluralism
2. Safety, law and order	Safety of persons and goods			
3. Public governance	Transparency, corruption control, efficiency of administration, independence of the justice system	Business start-ups		
4. Markets' operating freedom		Share of the private sector, privatization, price distortions introduced by the government	Share of the private sector, freedom of interest rates, independence of the central bank	Share of public-sector, employment, flexibility of the formal labor market
5. Technological environment, Expectations	Innovations and the authorities' strategic vision	Businesses' technological environment	Venture-capital	Vocational training
6. Security of transactions and contracts	Security of property rights and contracts, commercial justice, bankruptcy law	Information on the quality of goods, the situation of firms, intellectual property	Guarantee systems, obligation to provide information	Respect for labor laws
7. Regulations and corporate governance	Regulation of competition	Regulation of competition, corporate governance	Regulation of competition, prudential rules, supervision	Social dialogue
8. Openness to the outside world	Circulation of persons and information	Trade openness	Financial openness	Circulation of workers
9. Social cohesion	Social equilibrium, equality of treatment, social mobility, solidarity		Micro-leading	Market segmentation and social mobility

Source: http://www.cepii.fr/anglaisgraph/bdd/institutions.htm

The advantages of this database consist of the following. First, the respondents are relatively homogenous since all of them are French civil servants working in each of the country surveyed (Benassy-Quere, Coupet, & Mayer, 2007). Second, the IP database is focused from the start on the issues of long-term growth and development[49] (Meisel & Aoudia, 2007). Third, the IP database covers a large number of institutional aspects[50]. Here we work at the first level of aggregation, i.e. on 96 institutional variables. Since institution variables are often correlated with one another, it is generally not possible to include several institutions in the single equation. Thus here we introduce each of the 96 institution variables in estimation where the institutional variable is limited to only one variable – the institutional characteristic of the host country.

5.4.3 Data on other control variables

The nominal GDP and GDP per capita (GDPCAP) are in US dollars. OP is total trade as percentage of GDP. Data on GDP, GDPCAP and OP have been taken from the World Development Indicators database of the World Bank. Time-invariant bilateral characteristics (distance, contiguity and common language) are obtained from the Centre D' etudes Prospective Et D' information Internationals (CEPII). The labor (RFE) is given as the share of home country skilled labor in total skilled labor of the two countries, $S_i/(S_i + S_j)$, and the share of home's unskilled labor, $L_i/(L_i + L_j)$. These are obtained from the World Development Indicators data base of the World Bank. Exchange rate (ER) is obtained from International Financial Statistics of the International Monetary Fund. Average Applied Tariff Rates (TARF) is obtained from the World Bank[51]. Corporate income tax (TAX) is obtained from KPMG's Corporate Tax Rate Survey. Summary statistics are shown in Table 5-4. Note that ER is the exchange rate of the host

[49] Other databases have different focuses. For instance, the Freedom House provides an institutional database focusing on the evaluation of freedom in the world. See: http://www.freedomhouse.org.

[50] Meisel and Aoudia (2007) compared the IPD to the six governance indicators used by the World Bank Institute (WBI), using two principal components analyses (PCAs). They shown that the IPD covers a much vaster institutional field of governance described by the WBI's indicators.

[51] Permanent URL for this page: http://go.worldbank.org/LGOXFTV550

countries currency measured by foreign currency per domestic currency. Hence, increase (decrease) in ER indicates appreciation (depreciation) of domestic currency.

Table 5-4: Summary Statistics

Definition	Mean	Std. Dev.	Min	Max
FDI inflow (millions $)	97.4001	371.2228	0	7921.7
Home GDP ($)	1.23e+11	5.15e+10	6.52e+10	2.86e+11
Host GDP ($)	2.46e+18	1.51e+19	1.28e+09	1.21e+20
Distance	8039.443	5011.799	315.5433	19276.41
Sum of GDP	2.46e+18	1.51e+19	6.65e+10	1.21e+20
Relat. Factor Endow.	1.10995	.2363716	.3841963	1.628932
Exchange Rate ($)	.192495	.2390435	.000098	.7092199
Openness	109.3162	52.11392	52.26474	220.4073
Tariff	7.950982	5.037481	0	19.8
Cor.Tax	29.25455	3.488309	20	39
a100 |	2.534088	.4473202	1.831356	3.31462
a150	2.181818	.6944681	1	3
a101	2.279975	.7612833	.7844934	3.482011
a151	2.090909	.6450922	1	3
a102	2.073962	1.017186	1	4
a103	2.857187	1.113117	1	4
a104	1.808739	.754306	1	3
a200	2.677994	.764064	1.724172	4
a201	3.30303	.7583328	2	4
a250	1.742424	.5855616	1	3
a300	2.301153	.6404134	1.486292	3.804364
a301	2.670741	.7265597	1	4
a350	2.666667	.4714985	2	3
a302	1.97079	1.007908	1	4
a351	1.914955	.642332	0	2.55948
a303	2.035783	.9468231	1	4
a352	2.257576	.5855616	1	3
a304	1.905337	1.069132	1	4
a353	1.65839	.884989	0	3.416303
a354	2.515152	.49987	2	3
a305	2.632386	.5699807	1.98194	3.657241
a307	2.126225	.6610501	1	2.987386
a355	2	.4264865	1	3
a356	1.603782	.7803479	.5044457	3.011151
a510	2.827094	.74874	1.287388	4
a511	2.484349	.678694	1	3.369358
a512	2.969697	.9371338	1	4
a513	2.650331	.7893345	1.321426	4
a515	3.136364	.7957214	2	4
a600	2.273547	1.257895	0	4
a601	2.834367	.6694054	1.760475	4
a602	3.056628	.6812405	2	4
a603	2.724789	.5778828	2	3.724256
a604	3.106061	.6000957	2	4
a605	2.384438	.7761187	1	3.520639

Table 5-4: Summary Statistics (Cont.)

Definition	Mean	Std. Dev.	Min	Max
a606	2.414379	1.106463	.5001568	4
a607	1.865376	.6051027	1.321279	3.006459
a650	2.484848	.49987	2	3
a800	3.28475	.4539458	2.631551	4
a803	2.041404	.8179781	.3238837	3.676116
a900	2.645441	.6944467	1.657739	3.663048
a901	2.937086	.8457546	1.635442	4
a902	2.256295	.9002647	1	3.556741
a903	3.395547	.2913632	2.91706	4
a904	1.566359	.6925173	.6156725	3.074262
b300	2.485392	.7456693	1.26435	3.650182
b400	2.227273	.5979804	1	3
b403	2.814514	.7179933	1.821388	4
b451	2.324815	.5404238	1.247295	3.251163
b452	2.325502	.5633388	1.351357	3
b500	2.485392	.7456693	1.26435	3.650182
b600	2.571295	.7310437	1.40037 1	4
b602	2.681818	.8378965	1 .869822	4
b603	1.789318	.9331637		4
b604	2.11881	.9702582		4
b700	2.513475	.7245253	1	4
b701	2.712121	.9174442	1	4
b702	1.166667	1.0674	0	3
b704	2.84349	.7403552	2	4
b710	2.5	.857404	1	4
b800	3.330639	.6681107	1.536682	4
c400	2.575758	.8716164	1	4
c402	2.536851	.6660507	.9167659	3.189826
c453	1.201027	.7769575	0	2.556332
c500	2.333333	1.034956	1	4
c501	1.893939	1.338841	0	4
c502	2.110525	.7809544	.4433451	3.601135
c600	2.670279	.6751578	1 .	3.522806
c601	2.969697	8069574	1	4
c602	2.791219	1.10792	.4894912	4
c603	2.893939	.8728013	1	4
c700	3.090909	.8831338	1	4
c702	3.034074	.8716067	1	4
c703	2.783178	1.005175	1	4
c704	2.53363	.9110422	1	4
c750	2.523042	.8330718	1	3.683491
c800	1.843268	.5777314	.7804589	2.912283
c850	2.541977	.9208475	1	4
c900	1.777043	1.042111	0	3.546893
d100	1.920497	.8023954	.9410718	3.777451
d101	2.681818	1.316353	1	4
d401	3.415177	.4063758	2.612047	4
d450	.3378381	.5510506	0	1.513412
d500	2.132177	.9328717	1	3.549703
d600	2.128788	.9018223	1	4
d601	1.77248	.9172066	0	3.55462
d602	2.419554	.5458017	1.698813	3.395849
d603	1.880171	.9179229	0	3
d700	3.333333	.7455046	2	4
d701	2.148489	.7510727	.7702506	3.420785

Table 5-4: Summary Statistics (Cont.)

Definition	Mean	Std. Dev.	Min	Max
d800	2.54147	.5210922	1.461837	3.494708
d900	2.648517	.4501034	1.671897	3.280305
d901	2.637021	.7113352	1.461863	4
d902	3.046968	.6995445	1.629265	3.697942
d903	2.590909	1.124708	1	4
d950	.3973346	.7317732	0	2

5.5 Results

In order to avoid the problems of multicollinearity, we include institutional variables in the regressions one at a time. Estimates which are institutional coefficients and their standard errors are similar between specification (5-3) which derived from the horizontal FDI model and specification (5-4) which derived from the vertical FDI model. The results are reported in table 5-5 for the total 34 best fits (out of 96 regressions). Note that all specifications include a full set of time, home, and host country fixed effects. The robust standard errors have been computed. The model explains a high proportion – approximately 70 percent – of the total variation of FDI inflow to ASEAN. In most cases, the coefficient of the institutional variables is significant at the one percent level and positive. Taking into account control variables in specification (5-3) and in specification (5-4), distance, corporate income tax, and home country GDP have a significant and expected sign. We present all detail of regression results.

In most of 34 best fits, the estimates have the predicted sign. This means that good institutions in the host country have a positive impact on bilateral FDI in ASEAN. Variables namely political rights and functioning of political institutions, quality of local authorities, transparency of public action, lack of corruption, good government-citizen relations, effectiveness of public action, security of traditional property rights, law on bankruptcies, the security of transactions, , intellectual property, arrangements for fall into this category. Furthermore the results highlights the importance of share of public sector in GDP, the protection of intellectual property, competition between businesses: competition regulation arrangements, liberalize the credit sector,

dissemination of technology, innovation, lender guarantees, banking and financial supervision, the regulation of the financial system, reforms to make the formal labor market more flexible, labor legislation and measures, and labor inspectorate for inward FDI. These results confirm that good institutions promote inward FDI.

The quality of some institutions in the host country has a sizable impact on inward FDI. In table 4-6, we present the institutional data for our 34 best fits. For instance, host countries that had improvements in level of transparency of public action (A350) such as Indonesia and Thailand from in 2001 with a variable equal to 2 to in 2006 with a variable equal to 3, they are estimated to receive 38.13[52] percent more FDI. On the other hand, host countries that had decline in level of transparency of public action such as Malaysia and Philippines from a variable equal to 3 in 2001 to 2 in 2006, they are estimated to 27.60[53] percent less FDI. For arrangements for the protection of intellectual property (B604), comparing Vietnam with a lowest level (a variable equal to 1) to Singapore with the highest level (a variable equal to 4), PPML leads to a 325 percent more FDI received if Vietnam are able to improve their level to Singapore level.

In addition our results indicate that good institutions discourage FDI. The institutions that fall in this category consist of public freedoms and the autonomy of the civil society, internal public security, running of the customs administration, free movement of persons and information, implementation of the privatization program, openness of the privatization program, dissemination of technology, information on the structure of shareholdings in local firms, insurance companies, competition within the banking system, openness to foreign capital and loans, and rigidity of the formal labor market. However these results should not be interpreted to mean in order to attract FDI, ASEAN countries should reduce qualities of those institutions. They are able to interpret that there is no direct positive effect of those institutional variables on FDI.

[52] 38.13 percent = [exp(1*0.323)-1]*100%
[53] -27.60 percent = [exp(-1*0.323)-1]*100%

Comparing our results to the other empirical studies, we find that there are only two studies that indicate a negative relation between institutions in the host country and FDI inflow[54]: Naude and Krugell (2007) and Benassy-Quere, Coupet and Mayer (2007). The latter use the same source of institutional variables as we do in this study. They found two cases having negative link between institutions and FDI inflow and those two cases are not significance in our study. In our regressions there are two cases having negative impact between institutions and inward FDI that shown positive relation in Benassy-Quere, Coupet and Mayer (2007). In Naude and Krugell (2007), they used KKZL data and found that political stability and accountability have a negative impact. However, they have no addition explanation for these relations.

Finally in table 4-6 we summarize the results in framework of institutional themes. We found that security of transactions and contracts have strong relation to increase FDI inflow in ASEAN countries. In addition, public governance has a second rank of promoting FDI in ASEAN.

[54] As shown in our table 5-2, most of the recent studies indicated positive link between institutions and inward FDI.

Table 5-5: Estimates of Equation (5-3) – Equation (5-4) with IP data

	Code	Institutions	Eq.(5-3)			Eq.(5-4)		
			Coeff.	se	R-sq	Coeff.	se	R-sq
1	A100	Political rights and functioning of political institutions	1.579***	(0.428)	0.739	1.582***	(0.433)	0.730
2	A101	Public freedoms and the autonomy of the civil society	-1.311*	(0.616)	0.726	-1.292*	(0.622)	0.727
3	A103	Centralization - decentralization: devolution of local authorities	2.248***	(0.479)	0.732	2.334***	(0.481)	0.728
4	A200	Internal public security	-0.890*	(0.395)	0.727	-0.952*	(0.392)	0.728
5	A350	Evolution of transparency of public action in the past 3 years	0.323*	(0.141)	0.727	0.362*	(0.142)	0.729
6	A302	(Lack of) Corruption / Corruption	1.135***	(0.328)	0.730	1.226***	(0.326)	0.731
7	A351	Evolution of petty and large-scale corruption in the past 3 years	0.574**	(0.211)	0.727	0.594**	(0.209)	0.729
8	A303	Government-citizen relations				0.302*	(0.151)	0.727
9	A304	Effectiveness of public action: tax system	0.994**	(0.361)	0.728	1.102**	(0.363)	0.730
10	A305	Running of the customs administration	-1.307***	(0.361)	0.730	-1.373***	(0.360)	0.731
11	A600	Security of traditional property rights	0.814***	(0.233)	0.730	0.844***	(0.232)	0.731
12	A606	Law on bankruptcies	0.544*	(0.257)	0.726	0.541*	(0.257)	0.727
13	A650	Evolution of the security of transactions in the past 3 years	0.536*	(0.271)	0.726	0.584*	(0.266)	0.727
14	A800	Free movement of persons, information, etc	-0.773*	(0.316)	0.728	-0.847**	(0.317)	0.729
15	B400	Share of public sector in GDP				0.564*	(0.262)	0.728
16	B451	Implementation of the privatization program	-1.113***	(0.311)	0.729	-1.131***	(0.310)	0.730
17	B452	Openness of the privatization program	-0.881*	(0.412)	0.726	-0.880*	(0.413)	0.727
18	B500	Technological environment, dissemination of technology	-0.967*	(0.450)	0.726	-0.975*	(0.449)	0.727

Table 5-5: Estimates of Equation (5-3) – Equation (5-4) with IP data (Cont.)

	Code	Institutions	Eq.(5-3)			Eq.(5-4)		
			Coeff.	se	R-sq	Coeff.	se	R-sq
19	B603	Intellectual property	2.265***	(0.646)	0.729	2.351***	(0.642)	0.731
20	B604	Arrangements for the protection of intellectual property				0.483*	(0.223)	0.728
21	B702	Competition between businesses: competition regulation arrangements	0.561**	(0.178)	0.728	0.561**	(0.180)	0.729
22	B710	Information on the structure of shareholdings in local firms	-0.453*	(0.223)	0.726	-0.489*	(0.219)	0.727
23	C453	Reforms to liberalize the credit sector in the past 3 years				0.251*	(0.119)	0.727
24	C500	Dissemination of technology, innovation	0.466*	(0.194)	0.728	0.516**	(0.196)	0.729
25	C502	Insurance companies, pension funds	-0.899**	(0.326)	0.728	-0.975**	(0.324)	0.729
26	C602	Lender guarantees: banking system (mortgages etc)	0.393*	(0.192)	0.726	0.408*	(0.190)	0.727
27	C700	Competition within the banking system	-0.703**	(0.258)	0.727	-0.707**	(0.257)	0.728
28	C703	Banking and financial supervision	0.319*	(0.145)	0.727	0.358*	(0.146)	0.729
29	C750	Reforms of the regulation of the financial system in the past 3 years	0.559*	(0.190)	0.727	0.560**	(0.191)	0.729
30	C800	Openness to foreign capital and loans	-0.876**	(0.338)	0.727	-0.906**	(0.334)	0.729
31	D401	Rigidity of the formal labor market (private and public)	-0.532**	(0.185)	0.728	-0.572**	(0.184)	0.730
32	D450	Have there been reforms to make the formal labor market more flexible in the past 3 years	0.609**	(0.221)	0.727	0.606**	(0.223)	0.728
33	D601	Existence and observance of labor legislation and measures	0.720**	(0.247)	0.728	0.771**	(0.244)	0.729
34	D603	Labor inspectorate, labor courts, etc	0.432**	(0.143)	0.729	0.455**	(0.142)	0.730

Notes: All regressions include home country dummies, host country dummies and time dummies. The robust standard errors are in parentheses.

* p<0.05, ** p<0.01, *** p<0.001

Table 5-6: Institutional Data for 34 best fits

Code	Variables	Themes	Indonesia		Malaysia		Philippines		Singapore		Thailand		Vietnam	
			2001	2006	2001	2006	2001	2006	2001	2006	2001	2006	2001	2006
A100	Political rights and functioning of political institutions	Political Instit.	2.24	3.32	3.00	3.19	2.39	2.41	2.45	2.85	2.62	2.41	1.83	1.85
A101	Public freedoms and the autonomy of the civil society	Political Instit.	2.67	2.03	2.34	2.16	2.48	3.23	2.52	2.05	2.39	2.63	0.92	0.78
A103	Centralization – decentralization: devolution of local authorities	Political Instit.	3.00	4.00	2.65	2.74	4.00	4.00	2.00	2.00	1.00	1.00	4.00	4.00
A200	Internal public security	Safety, Law, Order	1.78	1.94	2.59	3.23	1.72	2.29	4.00	4.00	2.40	2.35	2.59	3.43
A302	Corruption (corrupt.)	Public Governance	1.00	1.48	2.51	2.00	2.00	1.00	4.00	4.00	1.51	1.52	1.48	1.00
A303	Government-citizen relations	Public Governance	1.00	1.49	3.00	2.00	2.00	1.00	3.49	4.00	1.00	2.00	1.49	2.00
A304	Effectiveness of public action: tax system	Public Governance	1.00	1.66	2.64	2.34	1.30	1.00	4.00	4.00	1.30	1.66	1.00	1.00
A305	Running of the customs administration	Public Governance	3.00	2.32	2.66	3.00	2.00	2.00	3.66	3.65	2.33	2.34	1.98	2.69
A350	Evolution of transparency of public act. in the past 3 yrs	Public Governance	2.00	3.00	3.00	2.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	3.00
A351	Evolution of petty & large-scale corrupt. in the past 3 yr	Public Governance	2.00	2.54	2.56	2.00	2.56	0.00	2.00	2.00	2.00	1.47	2.00	1.54
A600	Security of traditional property rights	Security of Transaction & contracts	2.06	3.00	3.53	2.51	3.00	3.00	0.00	0.00	4.00	3.00	2.00	1.00
A606	Law on bankruptcies	Security of Transaction & contracts	1.00	3.00	2.50	3.00	2.00	4.00	3.50	4.00	2.50	2.47	0.50	1.00
A650	Evolution of the security of transactions in the past 3 yrs	Security of Transaction & contracts	2.00	3.00	3.00	3.00	2.00	2.00	2.00	2.00	3.00	3.00	2.00	3.00
A800	Free movement of persons, information	Openness to the outside world	3.81	3.17	2.89	3.12	3.82	4.00	3.23	2.94	3.82	3.15	2.63	2.74
B400	Share of public sector in GDP	Markets' Operating Freedom	2.00	3.00	2.00	2.00	3.00	3.00	2.00	2.00	2.00	3.00	1.00	1.00
B451	Implementation of the privatization program	Markets' Operating Freedom	1.94	1.25	1.97	2.01	2.72	3.00	2.49	3.25	2.47	2.49	1.69	2.76
B452	Openness of the privatization program	Markets' Operating Freedom	2.99	1.65	2.35	1.35	3.00	3.00	2.00	2.29	3.00	2.35	2.00	1.65
B500	Technological environment, dissemination of technolog	Technological Environment	2.26	2.28	2.64	3.28	2.26	2.91	3.63	3.65	1.64	2.63	1.26	1.63
B603	Intellectual property	Security of Transaction & contracts	1.00	1.49	1.49	1.48	2.00	1.49	4.00	3.48	1.50	1.49	1.00	1.00
B604	Arrangements for the protection of intellectual property	Security of Transaction & contracts	2.00	2.52	2.00	1.00	2.00	2.00	4.00	4.00	2.00	2.00	0.87	1.00

Table 5-6: Institutional Data for 34 best fits (cont.)

Code	Variables	Themes	Indonesia		Malaysia		Philippines		Singapore		Thailand		Vietnam	
			2001	2006	2001	2006	2001	2006	2001	2006	2001	2006	2001	2006
B702	Competition between businesses: competition regulation arrangements	Regulations & Corporate Governance	1.00	3.00	0.00	0.00	1.00	1.00	3.00	2.00	2.00	1.00	0.00	0.00
B710	Information on the structure of shareholdings in local firms	Regulations & Corporate Governance	4.00	3.00	2.00	2.00	3.00	4.00	2.00	3.00	2.00	2.00	2.00	1.00
C453	Reforms to liberalize the credit sector in the past 3 yrs	Markets' Operating Freedom	0.00	0.84	1.54	1.08	1.73	1.00	1.35	0.00	0.39	2.56	2.21	1.70
C500	Dissemination of technology, innovation	Technological Environment	1.00	2.00	3.00	2.00	3.00	3.00	4.00	4.00	2.00	2.00	1.00	1.00
C502	Insurance companies, pension funds	Technological Environment	2.00	2.00	2.44	3.20	2.44	3.60	1.89	2.39	2.00	2.00	0.44	1.19
C602	Lender guarantees: banking system	Security of Transaction and contracts	1.00	3.00	3.00	3.457	3.00	4.00	4.00	4.00	3.00	3.00	0.489	2.00
C700	Competition within the banking system	Regulations and Corporate governance	4.00	3.00	3.00	3.00	4.00	3.00	3.00	3.00	4.00	4.00	1.00	2.00
C703	Banking and financial supervision	Regulations and Corporate governance	1.34	3.00	3.00	2.67	3.34	3.37	4.00	4.00	2.34	4.00	1.00	1.68
C750	Reforms of the regulation of the financial system in the past 3 yrs	Regulations and Corporate governance	2.00	3.00	3.68	3.00	2.52	1.00	3.37	2.35	3.63	2.00	2.00	1.31
C800	Openness to foreign capital and loans	Openness to the outside world	2.09	1.77	1.66	2.09	2.66	2.40	1.44	2.91	1.44	1.40	0.78	1.68
D401	Rigidity of the formal labor market (private and public)	Markets' Operating Freedom	3.71	2.61	3.32	3.62	3.29	4.00	3.39	3.38	3.61	2.62	3.39	4.00
D450	Have there been reforms to make the formal labor market more flexible in the past 3 yrs	Markets' Operating Freedom	0.00	1.51	0.00	0.00	0.00	0.00	0.00	0.73	1.42	0.51	0.00	0.00
D601	Existence and observance of labor legislation and measures	Security of Transaction and contracts	2.00	3.00	1.21	1.34	1.81	1.00	0.81	0.00	2.59	3.55	2.00	2.00
D603	Labor inspectorate, labor courts	Security of Transaction and contracts	1.00	3.00	3.00	2.11	1.00	2.00	1.78	3.00	2.44	2.45	1.00	0.00

Table 5-7: A summary results in the database and its structure context

Institutional themes in the columns	Institutional environment	Markets		
Institutional themes in the row	-A- Public institutions, Civil society	-B- Good and services	-C- Capital market	-D- Labor markets and social relations
(1).Political institutions	A100(+), A101(-), A151(-), A102 (-), A103(+)			
(2).Safety, law and order	A200(-)			
(3).Public governance	A350(+), A302(+), A351(+) A303(+), A304(+), A305(-)			
(4).Markets' operating freedom		B400(+), B451(-), B452(-)	C453(+)	D401(-), D450(+)
(5).Technological environment, Expectations		B500(-)	C500(+), C502(-)	
(6).Security of transactions and contracts	A600(+), A606(+), A650(+)	B603(+), B604(+)	C602(+)	D601(+), D603(+)
(7).Regulations and corporate governance		B702(+), B710(-)	C700(-), C703(+), C750(+)	
(8).Openness to the outside world	A800(-)		C800(-)	
(9).Social cohesion			C900(-)	

Note: (+) and (-) denote statistically significant and positive, and negative, respectively.

5.6 Conclusion

In this chapter, we visit the impact of institutional ‘quality’ on bilateral FDI in ASEAN during 1995 - 2005. The detailed Institutional Profile database is used to highlight the main institutions that matter. We found that security of transactions and contracts have strong relation to increase FDI inflow in ASEAN countries. These categories of institutions consist of security of traditional property rights, law on bankruptcies, the security of transactions, the protection of intellectual property, lender guarantees: banking system (mortgages etc), existence and observance of labor legislation and measures, and labor inspectorate and labor courts. In addition, the results indicate that good public governance has a positive relationship with FDI inflows. This category of institutions covers transparency, corruption control, efficiency of administration, and independence of the justice system. However we also find a negative relationship between good institutions and FDI. These results do not imply that FDI flows would be increased by institutional inefficiency. They only show that there is no direct positive effect of those institutional variables on FDI.

5.7 Appendix

Table A5-1: -A- Public institutions and civil society

Code	The Variable Names
1.Political Institutions	
A100	Political rights and functioning of political institutions
A150	Evolution of political rights in the past 3 years
A101	Public freedoms and the autonomy of the civil society
A151	Evolution of freedoms and civil society autonomy in the past 3 years
A102	Concentration of the media
A103	Centralization - decentralization: devolution of local authorities
A104	Centralization - decentralization: autonomy in tax matters
2.Safety, law and order	
A200	Internal public security
A201	External public security
A250	Evolution of the security in the past 3 years
3.Public governance	
A300	Transparency of public action in the economic field
A301	Transparency of economic policy (fiscal, taxation, monetary, exchange-rate, etc)
A350	Evolution of transparency of public action in the past 3 years
A302	Corruption / Corruption
A351	Evolution of petty and large-scale corruption in the past 3 years
A303	Government-citizen relations
A352	Evolution in the effectiveness of public action as a whole in the past 3 years
A304	Effectiveness of public action: tax system
A353	Tax reforms in the past 3 years
A354	Evolution of the efficiency of the tax system in the past 3 years
A305	Running of the customs administration
A307	Running of the justice system
A355	Evolution of the independence and efficiency of the justice system in the past 3 years
A356	Public administration reforms in the past 3 years
5.Technological environment	
A510	Capacity of the political authorities
A511	Society's aptitude for adaptation and innovation
A512	Long-term strategic vision of the authorities
A513	The authorities' strategies
A515	investment in the future of the population
6.Security of transactions and contracts	
A600	Security of traditional property rights
A601	Security of property rights: formal property rights
A602	Form of contracts between private agents

A603	Security of contracts between private agents
A604	Government respect for contracts
A605	Settlement of economic disputes: justice in commercial matters
A606	Law on bankruptcies
A607	Application of law on bankruptcies
A650	Evolution of the security of transactions in the past 3 years
8.Openness to the outside world	
A800	Free movement of persons, information, etc
A803	External pressure
9.Social cohesion	
A900	equality of treatment: segregation based on traditions and beliefs
A901	Access without discrimination to healthcare and public and private employment
A902	Subsidies for primary products (social safety net)
A903	Traditional forms of solidarity
A904	Institutional solidarity

Table A5-2: -B- Goods and services

Code	The Variable Names
3.Public governance	
B300	Administrative business start-up formalities
4.Markets' operating freedom	
B400	Share of public sector in GDP
B403	Administered prices and market prices
B451	Implementation of the privatisation programme
B452	Openness of the privatisation programme
5.Technological environment	
B500	Technological environment, dissemination of technology
6.Security of transactions and contracts	
B600	Information on the situation of firms
B602	Information on the quality of the goods: international norms and standards
B603	Intellectual property
B604	Arrangements for the protection of intellectual property
7.Regulations and corporate governance	
B700	Competition: productive sector: ease of market entry for new firms
B701	Competition in distribution (household consumption)
B702	Competition between businesses: competition regulation arrangements
B704	Interpenetration of local capital (private and/or public)
B710	Information on the structure of shareholdings in local firms
8.Openness to the outside world	
B800	Convertibility and WTO membership

Table A5-3: -C- Capital Market

Code	The Variable Names
4.Markets' operating freedom	
C400	Share of banking sector in private hands in 2001
C402	Level of government intervention in allocation of leading
C453	Reforms to liberalise the credit sector in the past 3 years
5.Technological Environment	
C500	Dissemination of technology, innovation
C501	Innovation: venture capital
C502	Insurance companies, pension funds
6.Security of Transactions and Contracts	
C600	Traditional credit systems (informal or quasi-informal)
C601	Information on the situation of the banks
C602	Lender guarantees: banking system (mortgages etc)
C603	Compulsory publication of information by firms at the time of share issues
7.Regulations and corporate governance	
C700	Competition within the banking system
C702	Prudential rules: difference between local and international standards
C703	Banking and financial supervision
C704	Internal control of banks
C750	Reforms of the regulation of the financial system in the past 3 years
8.Openness to the outside world	
C800	Openness to foreign capital and loans
C850	Reforms to open up the financial system in the past 3 years?
9.Social cohesion	
C900	Micro-lending

Table A5-4: -D- Labor market and Social relations

Code	The Variable Names
1.Political institutions	
D100	Freedom of association
D101	Trade union plurality and autonomy
4.Markets' operating	
D401	Rigidity of the formal labor market (private and public)
D450	Have there been reforms to make the formal labor market more flexible in the past 3 years.
5.Technological environment	
D500	Adult vocational training
6.Security of transactions and contracts	
D600	Informal labor market
D601	Existence and observance of labor legislation and measures
D602	Employment contract protection
D603	Labor inspectorate, labor courts, etc
7.Regulations and corporate governance	
D700	Wage bargaining for non-managerial staff
D701	Social dialogue
8.Openness to the outside world	
D800	Openness to employment of foreign executives
9.Social cohesion	
D900	Segmentation of the labor market
D901	Social mobility: Recruitment and promotion in the public and private sector
D902	Social mobility: Young graduates from higher education
D903	Child labor
D950	Have there been reforms aimed at de-segmentation of the labor market in the past 3 yrs?

Table A5-5: Estimates of Equation (5-3) with IP data

	A100	A101	A103	A200	A350	A302	A351	A304	A305	A600	A606	A650
Home GDP	0.648 (0.365)	0.651 (0.366)	0.644 (0.365)	0.647 (0.366)	0.648 (0.368)	0.644 (0.367)	0.648 (0.368)	0.647 (0.368)	0.643 (0.363)	0.646 (0.364)	0.650 (0.364)	0.652 (0.368)
Host GDP	-2.519* (1.012)	-0.882 (0.919)	3.182*** (0.953)	0.191 (0.869)	-0.443 (0.842)	-1.742 (0.904)	-2.082 (1.155)	-0.900 (0.838)	-0.696 (0.769)	-1.108 (0.757)	-0.0791 (0.825)	-0.829 (0.912)
Dist.	-0.391** (0.125)	-0.392** (0.125)	-0.391** (0.121)	-0.391** (0.120)	-0.390** (0.120)	-0.390** (0.120)	-0.391** (0.125)	-0.390** (0.119)	-0.390*** (0.119)	-0.391** (0.119)	-0.391** (0.122)	-0.391** (0.123)
Ex.	1.876** (0.648)	0.915 (0.598)	2.393*** (0.615)	0.534 (0.545)	0.752 (0.542)	1.520** (0.577)	1.454* (0.690)	1.042 (0.539)	1.223* (0.499)	1.321** (0.491)	0.626 (0.521)	0.757 (0.569)
Op.	-0.512 (0.486)	-0.314 (0.505)	-0.933 (0.501)	-0.941 (0.516)	-1.336* (0.594)	-1.530** (0.572)	-1.370* (0.565)	-1.399* (0.579)	-0.655 (0.504)	-0.493 (0.499)	-0.0981 (0.576)	-1.030 (0.539)
Tariff	0.369 (0.450)	0.835 (0.439)	0.121 (0.430)	0.359 (0.393)	0.279 (0.402)	-0.269 (0.443)	-0.394 (0.542)	0.208 (0.402)	0.557 (0.395)	1.050* (0.447)	1.339* (0.592)	0.588 (0.424)
Cor. Tax	-3.568* (1.513)	-2.613 (1.416)	-4.311** (1.540)	-3.475* (1.484)	-2.896* (1.393)	-3.692* (1.478)	-2.749 (1.471)	-3.232* (1.422)	-4.656* (1.553)	-3.777** (1.441)	-2.860* (1.386)	-2.060 (1.410)
Instit.	1.579*** (0.428)	-1.311* (0.616)	2.248*** (0.479)	-0.890* (0.395)	0.323* (0.141)	1.135*** (0.328)	0.574*** (0.211)	0.994** (0.361)	-1.307*** (0.361)	0.814*** (0.233)	0.544* (0.257)	0.536* (0.271)
R-sq	0.729	0.726	0.732	0.727	0.727	0.730	0.727	0.728	0.730	0.730	0.726	0.726
N	2204	2204	2204	2204	2204	2204	2204	2204	2204	2204	2204	2204

Table A5-5: Estimates of Equation (5-3) with IP data (Cont.)

	A800	B451	B452	B500	B603	B702	B710	C500	C502	C602	C700	C703
Home GDP	0.647 (0.367)	0.644 (0.363)	0.649 (0.367)	0.652 (0.367)	0.646 (0.368)	0.650 (0.366)	0.651 (0.369)	0.648 (0.367)	0.646 (0.367)	0.652 (0.367)	0.646 (0.362)	0.648 (0.367)
Host GDP	-0.277 (0.830)	-0.768 (0.838)	-1.189 (1.161)	-1.008 (0.935)	-2.821* (1.117)	-1.819 (0.933)	-1.224 (1.075)	-0.487 (0.805)	-0.755 (0.856)	-0.713 (0.855)	0.463 (0.905)	-0.292 (0.835)
Dist.	-0.390** (0.120)	-0.391** (0.123)	-0.392** (0.127)	-0.392** (0.124)	-0.391** (0.124)	-0.392** (0.124)	-0.391** (0.124)	-0.391** (0.119)	-0.390** (0.120)	-0.391** (0.123)	-0.391** (0.121)	-0.390** (0.120)
Ex.	0.745 (0.535)	1.202* (0.548)	1.104 (0.729)	0.887 (0.592)	1.919** (0.676)	1.428* (0.599)	0.928 (0.633)	0.791 (0.518)	0.978 (0.553)	0.740 (0.553)	0.546 (0.528)	0.682 (0.538)
Op.	-1.217* (0.557)	-0.277 (0.522)	-0.608 (0.494)	-0.677 (0.486)	-1.447** (0.548)	-0.500 (0.485)	-1.211* (0.590)	-1.107* (0.534)	-1.376* (0.574)	-0.738 (0.489)	0.0888 (0.614)	-1.263* (0.581)
Tariff	0.271 (0.396)	0.187 (0.422)	-0.0513 (0.574)	0.694 (0.433)	-0.480 (0.506)	0.659 (0.434)	0.219 (0.476)	0.709 (0.412)	-0.065 (0.432)	0.825 (0.443)	1.102* (0.498)	0.382 (0.395)
Cor. Tax	-3.305* (1.433)	-4.934** (1.697)	-3.112* (1.502)	-2.260 (1.415)	-3.275* (1.516)	-2.992* (1.460)	-2.074 (1.434)	-2.860* (1.381)	-3.404* (1.449)	-2.176 (1.399)	-4.123** (1.580)	-2.888* (1.388)
Instit.	-0.773* (0.316)	-1.113*** (0.311)	-0.881* (0.412)	-0.967* (0.450)	2.265*** (0.646)	0.561** (0.178)	-0.453* (0.223)	0.466* (0.194)	-0.899** (0.326)	0.393* (0.192)	-0.703** (0.258)	0.319* (0.145)
R-sq	0.728	0.729	0.726	0.726	0.729	0.728	0.726	0.728	0.728	0.726	0.727	0.727
N	2204	2204	2204	2204	2204	2204	2204	2204	2204	2204	2204	2204

Table A5-5: Estimates of Equation (5-3) with IP data (Cont.)

	C750	C800	D401	D450	D601	D603
Home GDP	0.650 (0.367)	0.646 (0.363)	0.645 (0.366)	0.650 (0.366)	0.646 (0.367)	0.646 (0.364)
Host GDP	-2.108 (1.093)	0.499 (0.901)	-0.590 (0.831)	-1.500 (0.942)	-1.058 (0.896)	-0.305 (0.778)
Distance	-0.392** (0.125)	-0.391** (0.119)	-0.390** (0.120)	-0.392** (0.125)	-0.390** (0.121)	-0.390*** (0.118)
Ex Rate	1.506* (0.672)	0.490 (0.530)	0.962 (0.540)	1.235* (0.605)	1.110 (0.575)	0.923 (0.490)
Openness	-0.738 (0.489)	-0.420 (0.520)	-1.222* (0.544)	-0.454 (0.486)	-1.416* (0.572)	-0.619 (0.502)
Tariff	0.287 (0.472)	0.862 (0.443)	0.0288 (0.414)	0.700 (0.435)	-0.280 (0.464)	0.956* (0.441)
Cor. Tax	-2.843 (1.478)	-3.945* (1.535)	-3.753* (1.487)	-2.797 (1.444)	-3.401* (1.459)	-3.861** (1.455)
Instit.	0.559** (0.190)	-0.876** (0.338)	-0.532** (0.185)	0.609** (0.221)	0.720* (0.247)	0.432** (0.143)
R-sq	0.727	0.727	0.728	0.727	0728	0.729
N	2204	2204	2204	2204	2204	2204

Table A5-6: Estimates of Equation (5-4) with IP data

	A100	A101	A103	A200	A350	A302	A351	A303	A304	A305	A600	A606
Home GDP	1.246* (0.527)	1.237* (0.532)	1.266* (0.521)	1.267* (0.525)	1.274* (0.528)	1.282* (0.525)	1.264* (0.537)	1.268* (0.532)	1.278* (0.525)	1.269* (0.514)	1.256* (0.517)	1.237* (0.524)
Host GDP	-2.354* (1.010)	-0.717 (0.914)	-3.078** (0.953)	0.387 (0.866)	-0.282 (0.837)	-1.642 (0.895)	-1.955 (1.137)	-0.00791 (0.863)	-0.765 (0.833)	-0.528 (0.769)	-0.937 (0.762)	0.0847 (0.826)
Distance	-0.400*** (0.120)	-0.399*** (0.120)	-0.401*** (0.117)	-0.400*** (0.115)	-0.401*** (0.115)	-0.401*** (0.116)	-0.401*** (0.120)	-0.401*** (0.116)	-0.401*** (0.114)	-0.400*** (0.114)	-0.400*** (0.114)	-0.399*** (0.117)
Sum of GDP	-0.627 (0.399)	-0.621 (0.404)	-0.631 (0.393)	-0.634 (0.396)	-0.627 (0.398)	-0.636 (0.394)	-0.634 (0.404)	-0.624 (0.402)	-0.628 (0.396)	-0.636 (0.389)	-0.622 (0.392)	-0.618 (0.399)
Relat. Factor Endow.	0.557 (0.700)	0.423 (0.699)	1.036 (0.684)	0.916 (0.669)	1.216 (0.676)	1.270 (0.678)	0.818 (0.698)	1.109 (0.679)	1.313 (0.675)	1.021 (0.659)	0.956 (0.660)	0.524 (0.686)
Ex Rate	1.876** (0.642)	0.905 (0.590)	2.467*** (0.615)	0.545 (0.539)	0.797 (0.536)	1.608** (0.572)	1.486* (0.681)	0.564 (0.553)	1.113* (0.535)	1.264* (0.492)	1.351** (0.487)	0.622 (0.515)
Openness	-0.467 (0.480)	-0.290 (0.498)	-0.839 (0.494)	-0.879 (0.513)	-1.299* (0.586)	-1.470** (0.562)	-1.316* (0.551)	-1.225* (0.611)	-1.348* (0.571)	-0.557 (0.503)	-0.391 (496)	-0.0574 (0.564)
Tariff	0.389 (0.445)	0.847 (0.433)	0.141 (0.428)	0.372 (0.391)	0.282 (0.399)	-0.289 (0.440)	-0.395 (0.534)	0.389 (0.403)	0.213 (0.399)	0.590 (0.392)	1.102* (0.441)	1.354* (0.583)
Cor. Tax	-3.577* (1.495)	-2.615 (1.400)	-4.404** (1.507)	-3.631* (1.455)	-3.043* (1.360)	-3.860** (1.442)	-2.784 (1.451)	-2.544 (1.334)	-3.405* (1.387)	-4.850** (1.521)	-3.871** (1.408)	-2.877* (1.366)
Instit.	1.582*** (0.433)	-1.292* (0.622)	2.334*** (0.481)	-0.952* (0.392)	0.362* (0.142)	1.226*** (0.326)	0.594** (0.209)	0.302* (0.151)	1.102** (0.363)	-1.373*** (0.360)	0.844*** (0.232)	0.541* (0.257)
R-sq	0.730	0.727	0.728	0.728	0.729	0.731	0.729	0.727	0.730	0.731	0.731	0.727
N	2204	2204	2204	2204	2204	2204	2204	2204	2204	2204	2204	2204

Table A5-6: Estimates of Equation (5-4) with IP data (cont.)

	A650	A800	B400	B451	B452	B500	B603	B604	B702	B710	C453	C500
Home GDP	1.255* (0.536)	1.273* (0.525)	1.269* (0.532)	1.259* (0.521)	1.249* (0.535)	1.244* (0.535)	1.270* (0.532)	1.264* (0.528)	1.242* (0.529)	1.258* (0.539)	1.266* (0.528)	1.268* (0.525)
Host GDP	-0.710 (0.908)	-0.0962 (0.826)	-0.256 (0.864)	-0.630 (0.833)	-1.054 (1.146)	-0.840 (0.932)	-2.709* (1.102)	0.0472 (0.828)	-1.647 (0.932)	-1.127 (1.061)	0.334 (0.877)	-0.316 (0.804)
Distance	-0.401*** (0.118)	-0.400*** (0.115)	-0.401*** (0.116)	-0.399*** (0.119)	-0.399** (0.123)	-0.400*** (0.120)	-0.401*** (0.120)	-0.401*** (0.115)	-0.400*** (0.120)	-0.401*** (0.119)	-0.400*** (0.116)	-0.401*** (0.114)
Sum of GDP	-0.616 (0.407)	-0.631 (0.396)	-0.622 (0.402)	-0.648 (0.394)	-0.638 (0.403)	-0.618 (0.406)	-0.635 (0.401)	-0.619 (0.400)	-0.621 (0.401)	-0.621 (0.408)	-0.632 (0.399)	-0.620 (0.397)
Relat. Factor Endow.	0.912 (0.680)	1.144 (0.671)	1.168 (0.679)	0.515 (0.684)	0.345 (0.699)	0.628 (0.696)	0.960 (0.695)	1.127 (0.666)	0.571 (0.698)	0.885 (0.693)	0.933 (0.673)	1.220 (0.664)
Ex Rate	0.790 (0.565)	0.781 (0.528)	0.671 (0.549)	1.218* (0.539)	1.106 (0.714)	0.889 (0.587)	1.972** (0.668)	0.580 (0.526)	1.425* (0.593)	0.970 (0.628)	0.493 (0.554)	0.835 (0.511)
Openness	-0.987 (0.532)	-1.162* (0.551)	-1.282* (0.613)	-0.235 (0.517)	-0.592 (0.488)	-0.622 (0.482)	-1.381* (0.537)	-0.988 (0.535)	-0.453 (0.479)	-1.172* (0.577)	-1.020 (0.544)	-1.033 (0.529)
Tariff	0.618 (0.420)	0.278 (0.394)	0.395 (0.403)	0.195 (0.418)	-0.0415 (0.565)	0.718 (0.427)	-0.481 (0.500)	0.809 (0.423)	0.679 (0.428)	0.221 (0.471)	0.290 (0.404)	0.764 (0.409)
Cor. Tax	-2.078 (1.394)	-3.482* (1.400)	-2.474 (1.341)	-5.007** (1.677)	-3.116* (1.489)	-2.275 (1.398)	-3.330* (1.490)	-2.634* (1.328)	-3.001* (1.442)	-2.089 (1.421)	-3.175* (1.399)	-2.987* (1.348)
Instit.	0.584* (0.266)	-0.847** (0.317)	0.564* (0.262)	-1.131*** (0.310)	-0.880* (0.413)	-0.975* (0.449)	2.351*** (0.642)	0.483* (0.223)	0.561* (0.180)	-0.489* (0.219)	0.251* (0.119)	0.516** (0.196)
R-sq	0.727	0.727	0.728	0.730	0.727	0.727	0.731	0.728	0.729	0.727	0.727	0.729
N	2204	2204	2204	2204	2204	2204	2204	2204	2204	2204	2204	2204

Table 5-5: Estimates of Equation (5-4) with IP data (cont.)

	C502	C602	C700	C703	C750	C800	D401	D450	D601	D603
Home GDP	1.277* (0.526)	1.247* (0.534)	1.245* (0.519)	1.272* (0.527)	1.246* (0.534)	1.257* (0.519)	1.276* (0.523)	1.240* (0.531)	1.276* (0.528)	1.262* (0.516)
Host GDP	-0.603 (0.851)	-0.554 (0.857)	0.611 (0.899)	-0.116 (0.831)	-1.940 (1.085)	0.691 (0.898)	-0.427 (0.828)	-1.329 (0.940)	-0.921 (0.889)	-0.112 (0.780)
Distance	-0.401*** (0.115)	-0.400*** (0.118)	-0.398*** (0.116)	-0.401*** (0.115)	-0.400*** (0.121)	-0.399*** (0.115)	-0.400*** (0.115)	-0.400*** (0.120)	-0.401*** (0.117)	-0.400*** (0.113)
Sum of GDP	-0.635 (0.396)	-0.616 (0.405)	-0.633 (0.395)	-0.626 (0.398)	-0.625 (0.404)	-0.633 (0.394)	-0.637 (0.394)	-0.621 (0.403)	-0.638 (0.397)	-0.626 (0.391)
Relat. Factor Endow.	1.140 (0.675)	0.750 (0.684)	0.449 (0.683)	1.196 (0.674)	0.571 (0.704)	0.755 (0.663)	1.096 (0.672)	0.512 (0.699)	1.059 (0.679)	1.027 (0.654)
Ex Rate	1.028 (0.547)	0.751 (0.549)	0.547 (0.520)	0.720 (0.531)	1.504* (0.665)	0.493 (0.523)	1.004 (0.534)	1.229* (0.598)	1.158* (0.568)	0.949* (0.484)
Openness	-1.326* (0.565)	-0.672 (0.486)	0.124 (0.603)	-1.221* (0.574)	-0.692 (0.483)	-0.345 (0.518)	-1.161* (0.537)	-0.415 (0.481)	-1.366* (0.561)	-0.515 (0.502)
Tariff	-0.0809 (0.429)	0.860* (0.436)	1.119* (0.491)	0.396 (0.393)	0.307 (0.467)	0.896* (0.438)	0.0242 (0.412)	0.718 (0.429)	-0.301 (0.459)	1.012* (0.437)
Cor. Tax	-3.569* (1.416)	-2.198 (1.381)	-4.159** (1.559)	-3.035* (1.356)	-2.850 (1.460)	-4.065** (1.506)	-3.939** (1.454)	-2.802* (1.427)	-3.536* (1.426)	-4.010** (1.422)
Instit.	-0.975** (0.324)	0.408* (0.190)	-0.707* (0.257)	0.358* (0.146)	0.560** (0.191)	-0.906** (0.334)	-0.572** (0.184)	0.606** (0.223)	0.771** (0.244)	0.455** (0.142)
R-sq	0.729	0.727	0.728	0.729	0.729	0.729	0.730	0.728	0.729	0.730
N	2204	2204	2204	2204	2204	2204	2204	2204	2204	2204

Bibliography

Aitken, N. D. (1973). The Effect of the EEC and EFTA on European Trade: a Temporal Cross Section Analysis. *American Economic Review, 63*, 881-892.

Aizenman, J., & Spiegel, M. M. (2006). Institutional Efficieny, Monitoring Costs, and the Investment Share of FDI. *Review of International Economics, 14*(4), 683-697.

Al-Atrash, H., & Yousef, T. (2000). Intra-Arab Trade: Is it Too Little. *IMF Working Paper*(WP/00/10).

Amjadi, A., & Yeats, A. J. (1995, December). *Have Transport Costs Contributed to the Relative Decline of Sub-Saharan African Exports? Some Preliminary Empirical Evidence.* The World Bank, International Economics Department. Washington D.C.: International Trade Division.

Anderson, J. E. (1979). A Theoretical Foundation for the Gravity Equation. *American Economic Review*(69), 106-116.

Anderson, J. E., & van Wincoop, E. (2003, Mar.). Gravity with Gravitas: ASolution to the Border Puzzle. *The American Economic Review, 93*(1), 170-192.

Anderson, J. E., & Wincoop, E. v. (2004, September). Trade Costs. *Journal of Economic Literature, 42*(3), 691-751.

Asiedu, E. (2006). Foreign Direct Investment in Africa: The role of Natural Resources, Market Size, Government Policy Instability. *The World Economy, 29*(1), 63-77.

Baier, S. L., & Bergstrand, J. H. (2001). The growth of world trade: tariffs, transport costs, and income similarity. *Journal of International Economics, 53*, 1-27.

Baltagi, B. H., Egger , P., & Pfaffermayr, M. (2003). A generalized design for bilateral trade flow models. *Economics Letters, 80*(3), 391-397.

Bank, A. D. (2006). *Asian Development Outlook.* Asian Development Bank.

Bayoumi, T., & Eichengreen, B. (1995). Is regionalism simply a diversion? Evidence from the evolution of the EC and EFTA. *CEPR Discussion Paper No.1294*.

Benassy-Quere, A., Coupet, M., & Mayer, T. (2007). Institutional Determinants of Foreign Direct Investment. *The World Economy, 30*(5), 764-782.

Bergeijk, P. A., & Brakman, S. (2010). Introduction: the comback of the gravity equation. In P. Bergeijk, & S. Brakman, *The gravity model in international trade: advances and applications.* Cambridge University Press.

Bergstrand , J. H. (1985). The Gravity Equation in International Trade: Some Microeconomic Foundations and Empirical Evidence. *Review of Economics and Statistics, 67*(3), 475-81.

Bergstrand , J. H. (1989). The Generalized Gravity Equation, Monopolistic Competition, and Factor Proportions Theory in International Trade. *Review of Economics and Statistics, 71*(1), 143-53.

Bhagwati , J., & Panagariya, A. (1996). *The Economics of Preferential Trade Agreement.* Washington DC.: AEI Press.

Bhagwati, J., & Krueger, A. (1995). *The Dangerous Drift to Preferntail Trade Agreements.* Washington DC.: AEI Press.

Blonigen, B. A. (2005). A Review of the Empirical Literature of FDI Determinants. *Atlantic Economic Journal, 33*, 383-403.

Busse , M. (2003). Tariffs, Transport Costs and the WTO Doha Round: The Case of Developing Countries. *The Estey Center Journal of International Law and Trade Policy, 4*(1), 15-31.

Carrère, C. (2004). African Regional Agreements: Impact on Trade with or without Currency Unions. *Journal of African Economies, 13*(2), 199-239.

Carrere, C. (2006). Revisiting the Effects of Regional Trade Agreements on Trade Flows with Proper Specification of the Gravity Model. *European Economic Review, 50*, 223-247.

Caves, R. E. (1996). *Multinational Enterprise and Economic Analysis* (Second ed.). NY: Canbridge University Press.

Cernat , L. (2001). Assessing Regional Trade Arrangements: Are South-South RTAs More Trade Diverting? *Global Economy Quarterly, 2*, 235-260.

Cheng , I.-H., & Wall, H. J. (2005, January/February). Controlling for Heterogeneity in Gravity Models of Trade and Integration. *Federal Reserve Bank of St.Louis Review, 87*(1), 49-63.

Clark, D. P. (2007). Distance, Production, and Trade. *Journal of International Trade and Economic Development, 16*(3), 359-371.

Clark, X., Dollar, D., & Micco, A. (2004). Port efficiency, maritime transport costs and bilateral trade. *Journal of Development Economics, 75*, 417-450.

Coe, D., & Hoffmaister, A. (1999). Norht-South Trade: Is Africa Unusual? *Journal of Afircan Economies, 8*(2), 228-256.

Combes, P. P., & Lafourcade, M. (2005). Transport costs: Measures, determinants and regional policy implications for France. *Journal of Economic Geography, 5*(3), 319-349.

Croce, E., Juan-Ramon, V. H., & Zhu, F. (2004, June). Performance of Western Hemisphere Trading Blocs: A Cost-Corrected Gravity Approach. *IMF Working Paper*(WP/04/109).

Dauae, C., & Stein, E. (2007). The Quality of Institutions and Foreign Direct Investment. *Economics and Politics, 19*(3), 317-344.

Daude, C., & Stein, E. (2007, November). The Quality of Institutions and Foreign Direct Investment. *Economics and Politics, 19*(3), 317-344.

Deardorff, A. V. (1998). Determinants of bilateral trade: does gravity work in a neoclassical world? In J. A. Frankel, *The Regionalization of the World Economy.* Chicago: University of Chicago Press.

Dee, P., & Gali, J. (2005). The Trade and Investment Effects of Preferential Trading Arrangements. In T. Ito, & A. K. Rose, *International Trade in East Asia* (pp. 133-176). University of Chicago Press.

Deltas, G., Desmet, K., & Facchini, G. (2006). Hub-and-Spoke Free Trade Areas. *CEPR Discussion Paper, No. 5960*.

Desbordes, R., & Vicard, V. (2009). Foreign direct investment and bilateral investmnet treaties: An international political perspective. *Journal of Comparative Economic, 37*(3), 372-386.

di Giovanni, J. (2005). What drives capital flows? The case of cross-border activity and financial deepening. *Journal of International Economics, 65*, 127-49.

Eaton, J., & Tamura, A. (1994). Bilateralism and Regionalism in Japanese and US Trade and Direct Foreign Investment Patterns. *Journal of the Japanese and International Economics, 8*, 478-510.

Egger, P. (2005). On the impact of transportation costs on trade in a mulilateral world. *Southern Economic Journal, 71*(3), 592-606.

Elliott, R. J., & lkemoto, K. (2004). AFTA and the Asian Crisis: Help or Hindrance to ASEAN Intra-Regional Trade? *Asian Economic Journal, 18*(1), 1-23.

Endoh, M. (1999). Trade creation and trade diversion in the EEC, the LAFTA and the CMEA: 1960-1994. *Applied Economics, 31*, 207-216.

Endoh, M. (2000). The Transition of Postwar Asia-Pacific Trade Relations. *Journal of Asian Economics, 10*, 571-587.

Ethier, W. J. (1998). The new regionalism. *The Economic Journal, 108*, 1149-1161.

Evenett , S. J., & Keller, W. (2002, April). On Theories Explaining the Success of the Gravity Equation. *The Journal of Political Economiy, 110*(2), 281-316.

Feenstra, R. C. (2004). *Advance International Trade: Theory and Evidence.* Princeton, NJ: Princeton University Press.

Foroutan, F., & Pritchett, L. (1993). Intra-Sub-Saharan African Trade: Is It Too Little? *Journal of African Economies*, 74-105.

Frankel , J. A. (1997). *Regional Trading Blocs in the World Economic System.* Washington, DC.: Institute for International Economics.

Geraci , V. J., & Prewo, W. (1977). Bilateral Trade Flows and Transport Costs. *The Review of Economics and Statistics, 59*(1), 67-74.

Globerman, S., & Shapiro, D. (2002). Global Foreign Direct Investmnet Flows: The Role of Governance Infrastructure. *World Development, 30*(11), 1899-1919.

Globerman, S., & Shapiro, D. (2003). Governance infrastructure and US foreign direct investmnet. *Journal of International Business Studies, 34*(1), 19-39.

Grossman, G. M. (1998). Comment. In J. A. Frankel, *The Regionalization of the World Economy* (pp. 29-31). Chicago, IL: University of Chicago Press.

Gujarati, D. N. (2002). *Basic Econometrics.* (4, Ed.) McGraw-Hill/Irwin.

Halvorsen, R., & Palmquist, R. (1980). The interpretation of dummy variables in semilogarithmic equations. *American Economic Review, 70*(3), 474-475.

Hamilton, C. B., & Winters, L. A. (1992). Opening up international trade with Eastern Europe. *Economic Policy, 14*, 77-116.

Harrigan, J. (2003). Specialization and the volume of trade: do the data obey the laws? In K. Choi, & J. Harrigan, *The Handbook of International Trade.* New York: Basil Blackwell.

Hausmann, R., & Fernandez-Arias, R. (2000). Foreign Direct Investment: Good Cholesterol? *Annual Meeting of the Board of Governors, Inter-American Development Bank and Inter-American Investment Corporation.* Inter-american Development Bank.

Helpman, E., & Krugman, P. R. (1985). *Market Structure and Foreign Trade; Increasing Returns, Imperfect Competition and the International Economy.* Cambridge: MIT Press.

Helpman, E., Melitz, M., & Rubinstein, Y. (2008, May). Estimating Trade Flows: Trading Partners and Trading Volumes. *Quarterly Journal of Economics, CXXIII*(2), 441-487.

Herrera , E. G. (2010, September). Retrieved November 12, 2010, from http://www.ugr.es/~teoriahe/RePEc/gra/wpaper/thepapers10_05.pdf

Hummels, D. (2000). Have International Transportation Costs Declined?

Hummels, D. (2007). Transportation Costs and International trade in the Second Era of Globalizaiton. *The Journal of Economic Perspectives, 21*(3), 131-154.

Hummels, D., & Lugovskyy, V. (2006). Are Matched Partner Trade Statistics a Usable Measure of Transportation Costs? *Review of International Economics, 14*(1), 69-86.

Jacks, D. S., & Pendakur, K. (2010, November). Global Trand and the Maritime Transport Revolution. *The Review of Economics and Statistics, 92*(4), 745-755.

Jacks, D. S., Meissner, C. M., & Novy, D. (2008). Trade Costs, 1870-2000. *American Economic Review: Papers & Proceedings, 98*(2), 529-534.

Johnson, H. G. (1962). *Money, Trade and Economic Growth: Survey Lectures in Economic Theory.* London: George Allen and Unwin.

Kaufman, D., Kraay, A., & Zoido-Lobaton, P. (1999). Aggregating Governance Indicators. *World Bank Working Paper, 2195*.

Kaufman, D., Kraay, A., & Zoido-Lobaton, P. (1999). Governance Matters. *World Bank Working paper , 2196*.

Kaufmann, D., Kraay, A., & Mastruzzi, M. (2009). Governance Matters VII: Governance Indicators for 1996-2008. *World Bank Policy Research*.

Kepaptsoglou, K., Karlaftis, M. G., & Tsamboulas, D. (2010). The Gravity Model Specification flor Modeling Internaitonal Trade Flows and Free Trade Agreement Effects: A 10-Year Review of Empirical Studies. *The Open Economics Journal, 3*, 1-13.

Kien, N. T., & Hashimoto, Y. (2005). *Economic Analysis of ASEAN Free Trade Area-By A Country Panel Data.* Retrieved December 2010, from http://www2.econ.osaka-u.ac.jp/library/global/dp/0512.pdf

Kleinert , J., & Toubal, F. (2010). Gravity for FDI. *Review of International Economics, 18*(1), 1-13.

Krugman, P. (1993). Regionalism versus multilateralism: Analytical notes. In J. De Melo, & A. Panagariya, *New Dimensions in Regioanl Integration* (pp. 58-80). Cambridge: Cambridge University Press.

Kuwamori, H. (2006, May). *The Role of Distance in determining International Transport Costs: Evidence from Philippine Impact Data.* Institute of Developing Economies. Japan External Trade Organization.

La Porta, R., Lopez-de-Silanes, & Vishny, R. (1998). The Quality of Government. *NBER Working Paper, 6727*.

La Porta, R., Lopez-deSilanes, F., & Vishny, R. (1997). Legal Determinants of External Finance. *Journal of Finance, 52*(3), 1131-1150.

Limao, N., & Venables, A. (2001). Infrastructure, grographical disadvantage, trapsort costs and trade. *The World Bank Economic Review, 15*(3), 451-479.

Markusen, J. R., & Maskus, K. E. (2002). Discriminating Among Alternative Theories of The Multinational Enterprise. *Review of International Economics, 10*(4, Nov), 695-707.

Martinez-Zarzoso , I., & Suarez-Burguet, C. (2005). Transport Costs and Trade: Empirical Evidence for Latin American Imports from the European Union. *Journal of Trade and Economic Development, 14*(3), 353-371.

Martinez-Zarzoso, I., & D., F. N.-L. (2007). Is Distance a Good Proxy for Transport Costs?: The Case of Competing Transport Modes. *Journal of International Trade & Economic Development, 16*(3), 411-434.

Matyas, L. (1997). Proper econometric specification of the gravity model. *The World Economy, 20*, 262-302.

Meisel, N., & Aoudia, J. O. (2007, September). A new institutional database: Institutional Profiles 2006. *DGTPE Working Papers*.

Micco, A., & Perez, N. (2002). *Determinants of Maritime Transport Costs.* Inter-American Development Bank.

Mishra, A., & Daly, K. (2007, June). Effect of Quality of Institutions on Outward Foreign Direct Invesment. *Journal of International Trade and Economic Development, 16*(2), 231-244.

Naude, W. A., & Krugell, W. F. (2007). Investigating geography and institutions as determinants of foreign direct investment in Africa using panel data. *Applied Economics, 39*, 1223-1233.

Nijman, T., & Verbeck, M. (1992). Incomplete Panels and Selection Bias. In *The Econometrics of Panel Data: Handbook of Theory and Applications* (pp. 262-302). Dordrecht: Kluwer Academic Publishers.

North, D. C. (1987). Institutions, Transactions Costs and Economic Growth. *Economic Inquiry, 25*(3), 419-428.

Nowak-Lehmann, F., Herzer, D., Martinez-Zarzoso, I., & Vollmer, S. (2007). The Impact of a Customs Union between Turkey and the EU on Turkey's Exports to the EU. *Journal of Common Market Studies, 45*(3), 719-743.

Oguledo, V. I., & MacPhee, C. R. (1994). Gravity Models: A Reformulation and an Application to Discriminatory Trade Arrangements. *Applied Economics, 26*(2), 107-20.

Radelet, S., & Sachs, J. (1998, January 1). *Shipping Costs, Manufactured Exports and Economic Growth.* Retrieved December 5, 2010, from The Earth Institute, Columbia University: http://admin.earth.columbia.edu/sitefiles/file/about/director/pubs/shipcost.pdf

Ramsey, J. B. (1969). Tests for Specification Errors in Classical Linear Least Squares Regression Analysis. *Journal of the Royal Statistical Society. Series B (Methodological), 31*(2), 350-371.

Redding, S., & Venables, A. J. (2000). Economic Geography and International Inequality. *CEPR Discussion Paper 2568*.

Rivera-Batiz, L. A., & Oliva, M.-A. (2003). *International trade: theory, strategies, and evidence.* USA: Oxford University Press.

Rose, A. K., & van Wincoop, E. (2001). National Money as a Barrier to International Trade: The Real Case for Currency Union. *American Economic Review, 91*(2), 389-390.

Sanchez, R. J., Hoffmann, J., Micco, A., Pizzolitto, G. V., Sgut, M., & Wilmsmeier, G. (2003). Port Efficiency and International Trade: Port Efficiency as a Determinant of Maritime Transport Costs. *Maritime Economics & Logistics, 5*, 199-218.

Siliverstovs, B., & Schumacher, D. (2009). Estimating gravity equations: to log or not to log? *Empir Econ, 36*, 645-669.

Silva, J. S., & Tenreyro, S. (2006). The Log of Gravity. *Review of Economics and Statistics, 88*(4), 641-658.

Soloaga, I., & Winters, L. A. (2001). How Has Regionalism in the 1990s Affected Trade? *North American Journal of Economics and Finance, 12*, 1-29.

Soloaga, I., & Winters, L. A. (2001). Regionalism in The Nineties: What Effect on Trade? *The North American Journal of Economics and Finance, 12*, 1-29.

Srinivasan , T. (1998). *Developing Countries and the Multilateral Tradeing System.* Boulder, CO.: Westview Press.

StataCorp. (2009). *Stata Statistical Software: Release 11.* College Station, TX: StataCorp LP.

Talbott, J., & Roll, R. W. (2001, November 13). *Why Many Developing Countries Just Aren't.* Retrieved December 15, 2010, from Social Science Research Network: http://www.cipe.org/programs/roundtables/webevents/pdf/talbot.pdf

Tang, D. (2005, June). Effects of the Regional Trading Arrangements on Trade: Evidence from the NAFTA, ANZCER and ASEAN Countries, 1989-2000. *Journal of Trade and Economic Development, 14*(2), 241-265.

Tanzi, V., & Davoodi, H. (1997, October). Corruption, Public Investment, and Growth. *IMF Working Paper, WP/97/139*.

The World Bank . (2001). *Global Economic Prospects and the Developing Countries 2002: Making Trade Work for the Poor.* Washington, D.C.

The World Bank. (2004). *Trade Policies in South Asia: An Overview (In Three Volumes) Volume ll: An Overview.* Washington, D.C.: The World Bank.

Tinbergen, J. (1962). *Shaping the world economy: Suggestions for an international economic policy*. New York: Twentieth Century Fund.

Trotignon, J. (2010, June). Does Regional Integration Promote the Mulitilateralization of Trade Flows? A Gravity Model Using Panel Data. *Journal of Economic Integration, 25*(2), 223-251.

Tumbarello, P. (2007, March). Are Regional Trade Agreements in Asia Stumbling or Building Blocks? Implications for the Mekong-3 Countries. *IMF Working Paper*.

UNCTAD. (2003). *Review of Maritime Transport, 2003.* New York and Geneva: United Nations.

Uttama, N. P., & Peridy, N. (2009). The Impact of Regional Integration and Third-Country Effects on FDI: Evidence from ASEAN. *ASEAN Economic Bulletin, 26*(3), 239-252.

Van den Berg, H. (2001). *Economic Growth and Development* (1 ed.). McGraw-Hill/Irwin.

Van den Berg, H., & Lewer, J. J. (2006). *International Trade and Economic Growth.* M.E.Sharpe.

Viner, J. (1950). *The Customs Union Issue.* New York: Carnegie Endowment for International Peace.

Waczing , R., & Welch, K. H. (2008). Trade Liberalization and Growth: New Evidence. *World Bank Econ Rev, 22*(2), 187-231.

Wooldridge , J. M. (2001). *Econometric Analysis of Cross Section and Panel Data.* The MIT Press.

WTO. (2004). *World Trade Report 2004 Exploring the linkage between the domestic policy environment and international trade.*

WTO. (2010). *International Trade Statistics 2010.* World Trade Organization.