

Pakistan's International Trade: the Potential for Expansion
Towards East and West

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1. Introduction

Pakistan faces high barriers to international trade across its eastern as well as western and north-western borders. Historically important east-west trade routes connecting India with central Asia and China passed through Pakistan. However, poor relations with India, war and political instability in Afghanistan, lack of development of transportation infrastructure for land routes to China, and strife in tribal areas and Baluchistan have impeded Pakistan's trade towards east and west. Expansion of east-west trade presents a great opportunity for Pakistan to increase its economic growth (Nabi, 2013). There has been much interest in exploring the effect of trade liberalization with India. The recent China-Pakistan Economic Corridor (CPEC) project has also stimulated interest in the potential for trade expansion with China.

The object of this research project is to identify the extent to which existing barriers influence Pakistan's east-west trade, and explore the potential for trade expansion available from reduction in these barriers. The project is divided into three parts. The first part assembled a large data set required to estimate the modern versions of the Gravity model of international trade. The second part estimates these versions and identifies the effect of east-west trade barriers on Pakistan's bilateral trade flows with its neighbors, in particular India and China. These estimates will be utilized in the third and final part to examine the potential for trade expansion available from a number policy actions for lowering trade barriers. This part will examine the impact of CPEC on trade with China, and of reduction of tariff and nontariff barriers on trade with India.

The second part of the project has now been completed. This progress report will mainly focus on explaining the methodology and discussing the results of the research in this phase of the project. Sections 2 of this report discusses the theoretical structure and the empirical

implementation of the gravity model. Section 3 briefly describes our data set and Pakistan's international trade. Section 4 explains our methodology and reports the results of our empirical analysis. Section 5 briefly discusses future work to be done to complete the project.

2. Gravity Model

2.1 Theoretical Structure

The Gravity model of international trade is now regarded as the main empirical tool for explaining bilateral trade flows. The traditional version of the Gravity model explains bilateral trade flows between a pair of countries as a positive function of each country's GDP and a negative function of the distance between the two countries, and can be expressed as

$$X_{ij,t} = A_t Y_{i,t}^{a_1} Y_{j,t}^{a_2} D_{ij}^{a_3}, \quad a_1 > 0, a_2 > 0, a_3 < 0, \quad (1)$$

where $X_{ij,t}$ is the value of export from country i to j , $Y_{i,t}$ and $Y_{j,t}$ are the GDP's of countries i and j in period t ; A_t is a period-specific constant term; and D_{ij} represents a measure of bilateral distance between the exporting and importing countries.¹ The distance measure is considered an index of the transportation cost between the country pair. Additional indexes of trade costs are often included in the above equation. Note that letting $M_{ji,t}$ denote the value of imports of j from i , $X_{ij,t} = M_{ji,t}$.² Thus, the gravity equation can be used to explain either import or export flows.

¹ Here we discuss the form suitable for panel data estimation. The time subscript is not needed for cross-section estimation (and is often dropped for expositional simplicity).

² In data, $X_{ji,t}$ and $M_{ji,t}$ can differ because of discrepancies in the measurement of trade flows by the importing and exporting countries.

Although the traditional gravity equation did not have clear-cut theoretical underpinnings, recent developments have derived gravity equations that can be related to new-style structural models of international trade. One popular structural gravity model developed by Anderson and van Wincoop (2003) can be derived from an international trade model with either perfect competition and the Armington (1969) assumption that goods are differentiated according to the country of origin or with monopolistic competition and differentiated varieties produced by homogeneous firms (Krugman, 1980). Letting $\sigma (> 1)$ denote the elasticity of substitution between differentiated goods or varieties (in a CES utility function) and $\tau_{ij,t} (> 1)$ a bilateral iceberg trade cost index (i.e., $\tau_{ij,t}$ units of a good or variety have to be shipped from i for one unit to arrive in j), the Anderson-van Wincoop model is expressed as

$$X_{ij,t} = \frac{Y_{i,t} E_{j,t}}{Y_t} \left(\frac{\tau_{ij,t}}{\Pi_{i,t} P_{j,t}} \right)^{1-\sigma}, \quad (2)$$

where $\Pi_{i,t}^{1-\sigma} = \sum_j \left(\frac{\tau_{ij,t}}{P_{j,t}} \right)^{1-\sigma} \frac{E_{j,t}}{Y_t}$, $P_{j,t}^{1-\sigma} = \sum_i \left(\frac{\tau_{ij,t}}{\Pi_{i,t}} \right)^{1-\sigma} \frac{Y_{i,t}}{Y_t}$, and $E_{j,t}$ is country j 's aggregate expenditure and Y_t is world income in period t . Under balanced trade, $E_{j,t} = Y_{j,t}$. The iceberg trade cost index captures variable trade costs (i.e., trade costs per unit of trade flow) and can be defined broadly to depend on transportation costs (a function of bilateral distance) as well as tariff and non-tariff barriers. The tariff equivalent of trade costs is given by $\tau_{ij,t} - 1$.

Both the traditional and the above structural gravity relations imply that bilateral trade flows can be expressed in the following multiplicative form:

$$X_{ij,t} = G_t S_{i,t} U_{j,t} \phi_{ij,t}, \quad (3)$$

where $S_{i,t}$, $U_{j,t}$ and $\phi_{ij,t}$ represent, respectively, the effect of factors specific to the exporting country i , importing country j , and the pair i, j in period t ; and G_t is a term that can vary over time but does not depend on country characteristics. The components specific to importers and exporters in the structural gravity model include variables $\Pi_{i,t}^{1-\sigma}$ and $P_{j,t}^{1-\sigma}$, and thus are different from the corresponding components in the traditional model.³ Anderson and van Wincoop (2003) call these variables inward and outward multilateral resistance terms. An important implication of their model is that the omission of these variables from the gravity equation can lead to a significant bias in the estimates of its coefficients.

The trade model with monopolistic competition has been extended by Melitz (2003) to allow for firm heterogeneity and fixed costs of exporting. The Melitz model has been successful in explaining some key features of international trade data (such as why only a proportion of firms in an industry are typically engaged in exporting) and is now widely used for trade policy analysis. Helpman et al. (2008) show that a gravity equation can also be derived from this model. Moreover, the gravity equation based on the Melitz model under balanced trade can be expressed in the following form that is similar to Anderson-van Wincoop model but incorporates an additional term:

$$X_{ij,t} = \frac{Y_{i,t} Y_{j,t}}{Y_t} \left(\frac{\tau_{ij,t}}{\tilde{\Pi}_{i,t} P_{j,t}} \right)^{1-\sigma} V_{ij,t}, \quad (4)$$

³ Equation 2 also has a different specification of trade frictions than (1). However, note that the bilateral component, $\phi_{ij,t}$, can be the same in the two equations if $\tau_{ij,t}$ is assumed to be an appropriate function of the distance index and additional (possibly time-variant) trade cost variables are included in the traditional model.

where $\tilde{\Pi}_{i,t}^{1-\sigma} = \sum_j \left(\frac{\tau_{ij,t}}{P_{j,t}} \right)^{1-\sigma} \frac{Y_{j,t}}{Y_t} V_{ij,t}$, and $V_{ij,t}$ is an index based on weighted average unit input

requirement (inverse of factor productivity) for i 's firms exporting to j .⁴ This index controls for the proportion of exporting firms and equals zero if no firms in i export to j . A firm in i will export to j if its input requirement is below the threshold needed for profitable export operation. Thus some firms in i will export to j if the threshold for i and j is above the minimum value of the input requirement; otherwise no firm in i will export to j . The threshold for a country pair depends on both fixed and variable costs of exporting and can vary from one pair to another.

To determine the bilateral threshold levels and the index $V_{ij,t}$, a typical assumption is that the distribution of input requirement across firms is characterized by the Pareto distribution. If the Pareto distribution is untruncated (lower bound for the input requirement equals zero), $V_{ij,t} > 0$ since some firms in i will have a low enough input requirement to export to j . The non-zero $V_{ij,t}$ term can be decomposed multiplicatively into three components depending on, respectively, the exporter, importer and trading pair characteristics. The gravity equation (4) for this version of the Melitz model can be expressed in the general form (3). The expression for the $\phi_{ij,t}$ component, however, is different in the Melitz model. In the Anderson-van Wincoop model, $\phi_{ij,t} = \tau_{ij,t}^{1-\sigma}$. In contrast, letting θ denote the shape parameter in the Pareto distribution and $\xi_{ij,t}$

the fixed input requirements for i exporting to j , $\phi_{ij,t} = \tau_{ij,t}^{-\theta} \xi_{ij,t}^{-\left(\frac{\theta}{\sigma-1}-1\right)}$ in the general form of the

⁴ Letting $\alpha_{ij,t}^*$ denote the input requirement threshold for i 's exports to j for period t , and $G(\alpha)$ represent the cumulative distribution function for input requirement with lower support equal to α_L , $V_{ij,t} = \int_{\alpha_L}^{\alpha_{ij,t}^*} \alpha^{1-\sigma} dG(\alpha)$ if $\alpha_{ij,t}^* \geq \alpha_L$; otherwise $V_{ij,t} = 0$.

Melitz model with untruncated Pareto distribution (see Head and Mayer, 2014). This expression implies that the elasticity of bilateral exports with respect to variable trade cost depend only on the shape parameter of the distribution while the elasticity with respect to fixed costs depends both on the shape parameter and the substitution elasticity.

One limitation of the above version of the Melitz model is that like the Anderson-van Wincoop model, it does not explain the fact that zero exports are observed for many country pairs. To explain this fact, Helpman et al. (2008) use a model which assumes a truncated Pareto distribution with non-zero lower support. In this version, $V_{ij,t} = 0$ and there is zero trade if the threshold for the i, j pair is below the lower support. This version of the model, moreover, cannot be expressed in the general form (3) because this form does not allow for zero trade. Estimating the model excluding observations with zero trade flows would introduce a selection bias.

2.2 Empirical Implementaton

Gravity models are genereally estimated in a log-linear form. For example, after adding a multiplicative error term, $e_{ij,t}$, the traditional gravity model can be expressed as

$$\ln X_{ij,t} = \ln A_t + a_1 Y_{i,t} + a_2 Y_{j,t} + a_3 \ln D_{ij} + \ln e_{ij,t} . \quad (5)$$

This equation can be estimated by OLS (time dummies can be used to estimate $\ln A_t$). The log-linear form of the Anderson-van Wincoop gravity model (with balanced trade and multiplicative error) is: $\ln X_{ij,t} = b_0 \ln Y_t + b_1 \ln Y_{i,t} + b_2 \ln Y_{j,t} + b_3 \ln \Pi_{i,t} + b_4 \ln P_{j,t} + b_5 \ln \tau_{ij,t} + \ln e_{ij,t}$, where $b_0 = -1$, $b_1 = b_2 = 1$, $b_3 = b_4 = \sigma - 1$ and $b_5 = 1 - \sigma$. Trade costs are typically modeled as

$\tau_{ij,t} = D_{ij}^\varepsilon T_{ij,t}$, where ε is the elasticity of trade costs with respect to distance and $T_{ij,t}$ is the effect of other determinants of trade costs generally represented by binary variables.⁵ The multilateral resistance terms, $\Pi_{i,t}$ and $P_{j,t}$, are not directly observable. Although some proxies for these variables can be derived, a typical approach is to estimate this model in the log-linear version of the general form (3):

$$\ln X_{ij,t} = \ln G_t + \ln S_{i,t} + \ln U_{j,t} + \ln \phi_{ij,t} + \ln e_{ij,t}. \quad (6)$$

In this form, $\ln S_{i,t} = \ln Y_{i,t} + (\sigma - 1) \ln \Pi_{i,t}$ and $\ln U_{j,t} = \ln Y_{j,t} + (\sigma - 1) \ln P_{j,t}$, and time-variant dummy variables for exporting and importing countries can be used to estimate these components. The component $\ln G_t = -\ln Y_t$ can be estimated using time dummies, but if there is no need to isolate the effect of this component, it could be dropped and its effect would then be included in the exporter and importer time-variant dummy variables. Finally, $\ln \phi_{ij,t}$ would depend on $\ln D_{ij}$ and indicator variables for other determinants of trade costs. OLS can also be used to estimate (6).

The Melitz model with untruncated Pareto distribution could also be represented by (6) with a different interpretation of the component, $\ln \phi_{ij,t}$. One basic problem with the log-linear form (6) is that it cannot include or explain zero bilateral trade flows. One approach is to estimate (6) excluding zero trade observations. This approach, however would introduce a selection bias because of the omission of observations with zero trade.

⁵ For example, other determinants of trade costs include dummy variables for whether a country pair shares a common border, language or colonial history or belongs to a regional trade agreement. Note that some of these variables like the membership of a regional trade agreements could vary over time.

The Melitz model with truncated Pareto distribution explains zero trade. For this model, Helpman et al. (2008) suggest a two-stage Heckman estimation procedure where the first stage model explains the choice of a pair of countries to trade or not to trade, and the second stage model explains bilateral trade flows for country pairs with non-zero trade. A limitation of this procedure is that it requires an exclusion restriction, that is, at least one variable that is included in the first-stage model but not the second-stage model. Such a variable is hard to find since the factors determining a firm's decision whether to export to a destination or not are also likely to influence the decision of how much to export if it chooses to export.

An alternative approach is suggested by a method proposed by Eaton and Kortum (2001) based on the Tobit model. According to this method, there is a critical value of exports for each country (in a given period), $X_{i,t}^L$, such that if "ideal" trade falls below this level, zero exports are observed, otherwise observed exports equal ideal exports. This method can be related to the heterogeneous firm model which implies that a country will not export to a destination if the threshold levels for the destination falls below the lower support of the truncated Pareto distribution. Threshold input requirements (varying across destinations) would determine country i 's exports to each destination. The critical value, $X_{i,t}^L$, can be interpreted as the lower bound for country i 's exports to different destinations in period t , and can be estimated from observed bilateral exports as $X_{i,t}^L = \min_j (X_{ij,t})$. This method can be implemented for estimating (6), by using interval regression with the dependent variable representing point data $(\ln X_{ij,t}, \ln X_{ij,t})$ for observations with non-zero trade and left-censored data $(-\infty, \ln X_{i,t}^L)$ for observations with zero trade.

Santos Silva and Tenreyro (2006) point out another problem with estimating (6), which arises if $e_{ij,t}$ is heteroskedastic and its variance depends on one or more of the explanatory variables. In this case, since the expected value of $\ln e_{ij,t}$ depends on the variance of $e_{ij,t}$, the OLS estimator would be biased and inconsistent. They show that under weak assumptions, the poisson pseudo-maximum likelihood (PPML) estimator provides consistent estimates of the original nonlinear model. As this procedure does not require logarithmic transformation of the dependent variable, it can accommodate zero trade flows. Thus PPML could be used to estimate a model that uses the same explanatory variables as in (6) to explain bilateral trade flows including zero flows.

3. Data

In this section we briefly describe our sample and discuss the evolution and the distribution of Pakistan's trade in our sample period.

3.1 Sample

We have assembled a panel data set that includes bilateral trade flows of 183 reporting countries with 253 partner countries from 2004 to 2013. For each year and reporting country, the bilateral data set includes data on the US dollar value of all exports to and all imports from each partner. The data set includes 515120 observations. The source of the data is the U.N. Comtrade Database. One feature of the data that stands out and is worth mentioning is the large proportion of country pairs that report zero trade flows. As Figure 1 shows, the proportion of country pairs with no trade is around the 60% mark in 2004 and edges steadily upwards thereafter.

We have also collected data on a number of indexes of trade costs. These indexes are in line with standard practice in the gravity literature and include, among others, the log of distance,

measured as the distance in kms between most populated cities. This ranges between 1.88 and 19904 kms, with a mean value of 7325 kms. We also measure trade costs by including dummies that take value 1 for common borders, common official or primary language and common colonizer after 1945. These data come from the CEPII gravity dataset. Finally we include a dummy that takes value 1 in case of membership to regional trade agreements (RTAs).

3.2 Pakistan's International Trade

Figure 2 shows that Pakistan's imports have grown from less than 20 billion in 2004 to nearly 45 billion US dollars in 2013 while exports have increased at a slower pace from less than 15 billion to about 25 billion US dollars over the same period. The share of imports in GDP has fluctuated, but has not changed much between 2004 and 2013. The share of exports in GDP has declined from 2004 to 2013 .

Pakistan trades with over 175 countries. However, the bulk of Pakistan's trade takes place with a much smaller number of countries. Figure 3 shows the percentage of Pakistan's imports originating from the top ten countries in 2004 and 2013. Figure 4 shows the proportion of Pakistan's exports destined to the top ten countries in the same years. The 10 largest trading partners for imports are different than for exports. As well, the list has changed from 2004 to 2013. USA is the largest importer of Pakistan's goods in both years, although its share of Pakistan's total exports declined from 23% to 15%. Saudi Arabia in 2004 and UAE in 2013 were the largest exporters to Pakistan.

A large country is likely to have large trade flows with Pakistan. To control for the size of the trade partner, we also examine Pakistan's bilateral imports and exports as a percentage of partner's GDP. According to this measure, Figure 5 shows the top ten countries in 2004 and

2013 for imports and Figure 6 the top 10 countries for exports.⁶ The leading trading partner list based on the size adjusted imports and exports is quite different. The two large neighbors of Pakistan, China and India, do not appear in this list.

4. Empirical Analysis

4.1 Methodology

Our main objective is to estimate the effect of east-west trade barriers on Pakistan's trade with neighboring countries. To control for other factors influencing Pakistan's bilateral trade, we use our panel data set to estimate gravity models. We use the bilateral trade data of all reporting countries to estimate the effect of other factors. Bilateral dummy variables for Pakistan and selected countries are then used to isolate the effect of east-west barriers for Pakistan. We initially consider four countries that share a common border with Pakistan: India, China, Afghanistan and Iran. We define bilateral dummy variables for Pakistan and each of these countries which take the value of 1 for observations for bilateral trade between Pakistan and the given neighbor and value of zero for all other observations.

In estimating the model, we focus on the general form (6). For estimating the effects of components $S_{i,t}$ and $U_{j,t}$, we consider time-variant dummy variables (i.e, a separate dummy variable for each year) for reporters and partners. As this formulation involves a very large number of dummy variables, we also use a simpler form which assumes that time effects are the same for all countries. In this form, fixed (time-invariant) reporter and partner dummies and dummies for years are used to estimate the effect of the monadic components $S_{i,t}$ and $U_{j,t}$. The

⁶ In Figure 6, we have excluded Afghanistan, as reported exports from Pakistan could include US supplies shipped through Pakistan and may have a considerable upward bias.

dyadic component $\phi_{ij,t}$ captures the effect of trade costs. We use the conventional indexes of trade costs represented by $\ln D_{ij}$ and dummy variables for common border, common official language, shared colonial history and membership in RTA's.⁷ In addition, we incorporate bilateral dummies for Pakistan and its neighbors to identify extra costs of east-west trade barriers for Pakistan.

For estimating the model, we use a balanced sample where the number of partner countries is reduced to make the partner country set the same as the reporter country set. As it is not clear whether reported imports or exports are a more accurate measure of bilateral trade flows, we estimate two models, one for explaining exports and the other for explaining imports. We consider three methods for estimating the structural gravity model.⁸ First, we use OLS to estimate a model for non-zero trade flows. This model suffers from a potential selection bias since zero trade observations are omitted. Second, we use EK Tobit procedure to estimate the model. This procedure includes all observations and is related to theory explaining zero trade, but can produce biased estimates because of heteroskedasticity. Finally, we employ PPML technique for estimation. This technique addresses the heteroskedasticity issue. It can also handle zero trade flows, but would use a model not designed to explain zero trade.⁹

4.2 Results

We estimate the three structural gravity models discussed above. For comparison, we also estimate a traditional gravity model. Tables 1 and 2 present the key results for these models.

⁷ In this set, only the dummy variable for RTA is potentially time variant (if a country joins or leaves an RTA during the sample period).

⁸ We did not use the 2-stage Heckman procedure because of a lack of satisfactory variable satisfying the exclusion restriction.

⁹ Another limitation of this procedure is that a number of country dummy variables and observations need to be dropped to ensure convergence in estimation.

Table 1 shows results for regressions explaining bilateral imports and Table 2 for regressions explaining bilateral exports. In each table, we present estimates of the traditional OLS regression in column (1), the structural OLS regression excluding zero trade observations in column (2), the EK Tobit regression including zero trade observations in column (3); and the PPML regression including zero trade observations in column (4).¹⁰ In the traditional regression, explanatory variables include the GDP of both the reporter and partner countries, but do not include any country- or time-specific dummy variables. All three structural regression include dummy variables for reporter and partner countries and for years (reporter and partner GDP is excluded). We also tried time-variant reporter and partner dummy variables in the structural regressions, but the results were not very different, and the tables focus on the simpler versions with a much smaller number of fixed effects.

We use the same set of trade cost variables for all regressions. This set include traditional indexes represented by $\ln D_{ij}$ and bilateral dummy variables labelled *contig* (contiguous country pair), *com_langoff* (common official language), *comcol* (common colonial history) and *rta* (part of an RTA). In addition, the set includes the dummy variables for Pakistan and each of its immediate neighbors, which are of special interest for this study. These variables are labelled *pak_india*, *pak_china*, *pak_afg* and *pak_iran*. In each regression, the coefficients of a variable represents the elasticity of the bilateral trade index with respect to the variable.

As the tables show, results for the structural regressions are different than the traditional regressions. Moreover, the coefficients of trade cost indexes vary considerably across the three structural regressions. With a few exceptions, the coefficients (in absolute values) are the highest

¹⁰ For reporter country i , partner country j and year t , the dependent variables in Tables 1 and 2 are $M_{ij,t}$ and $X_{ij,t}$ for PPML regressions and $\ln M_{ij,t}$ and $\ln X_{ij,t}$ for other regressions.

in the EK Tobit regression and the lowest in the PPML regression.¹¹ As would be expected, the coefficients for the pak-india dummy are significantly negative for all regressions in both tables. We find, moreover, that the coefficients for the pak-china dummy are also significantly negative in all cases. This result shows that both Pakistan's imports from and exports to China are significantly less than the values predicted by the traditional as well as structural gravity models. Pakistan has good relations with China and there are no apparent extra trade policy barriers between the two countries. Thus our findings provide strong support to the view that inaccessible land routes have diminished Pakistan's trade with China.

The coefficients for pak-afg dummy are positive and significant in all cases, and those for pak-iran dummy are significantly positive in some and insignificant in other cases. These results may seem surprising as war in Afghanistan and conflict in tribal areas and Baluchistan would be expected to impede Pakistan's trade with Afghanistan and Iran. Pakistan's reported trade with Afghanistan, however, could be significantly biased because it likely includes movement of good through Pakistan that are related to war operations. Moreover, other countries' trade with Afghanistan and Iran was hindered by Afghanistan war and sanctions on Iran, perhaps to a larger extent than Pakistan's trade with these countries. These factors could account for the surprising results.

5. Future Work

¹¹ One exception is the coefficients of the common border index (contig), which are insignificant for EK Tobit and significant and positive for the other structural regressions in both tables. The ordering of the coefficients for the pak-afg dummy is also different than for other variables.

Our empirical analysis above suggests that east-west barriers have significantly decreased Pakistan's trade with India and China. The next phase of the project will explore the potential for the expansion of Pakistan's trade with these countries. In structural gravity models, estimates of the coefficients of Pakistan-India and Pakistan-China dummy variables can be linked to variable and fixed trade costs. We will develop a model that would relate these costs to different policy actions. This model and estimates from the structural gravity equation will be used to construct a number of policy scenarios. These scenarios will include examining the effect of specific reductions of tariff and nontariff barriers on trade with India, and the impact of reduction in transportation costs via CPEC on trade with China.

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Figure 1

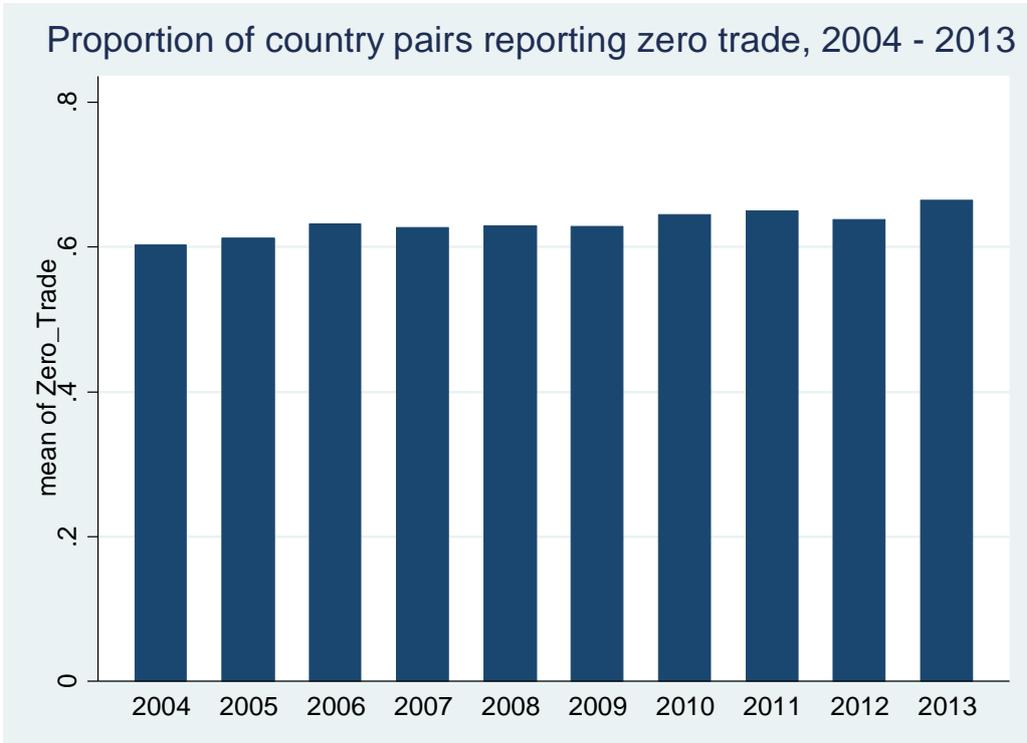


Figure 2

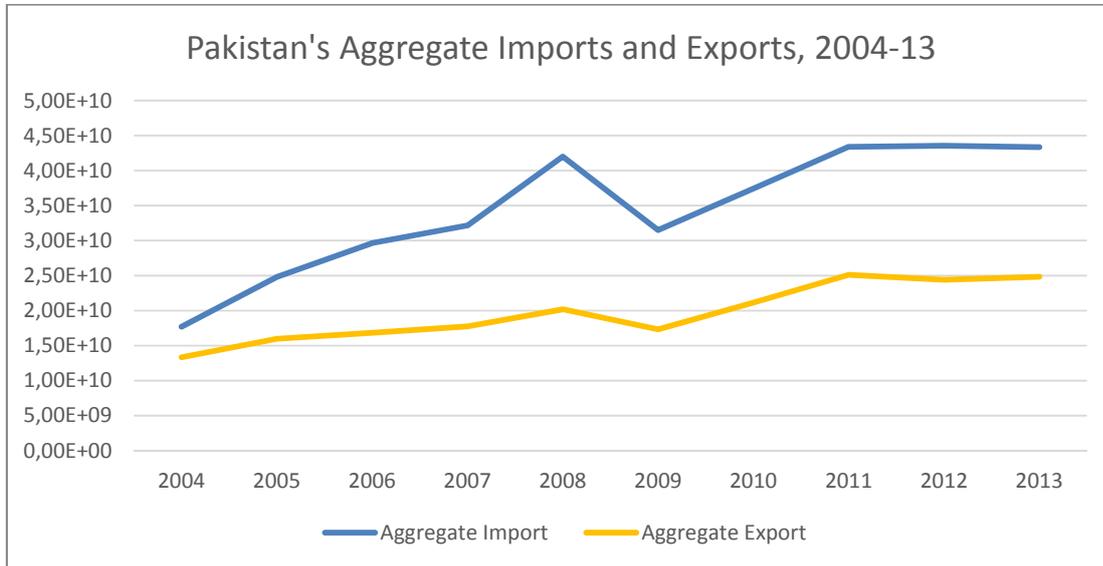


Figure 3

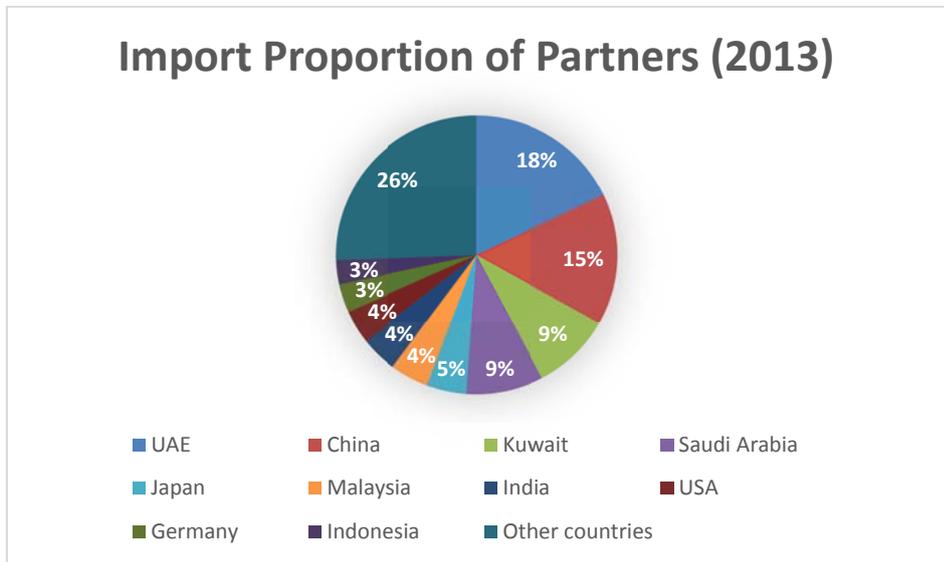
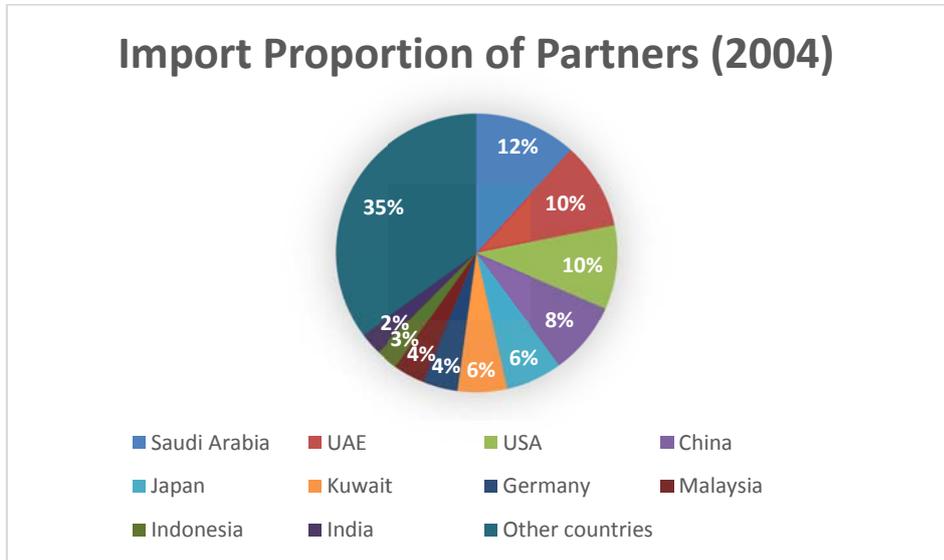


Figure 4

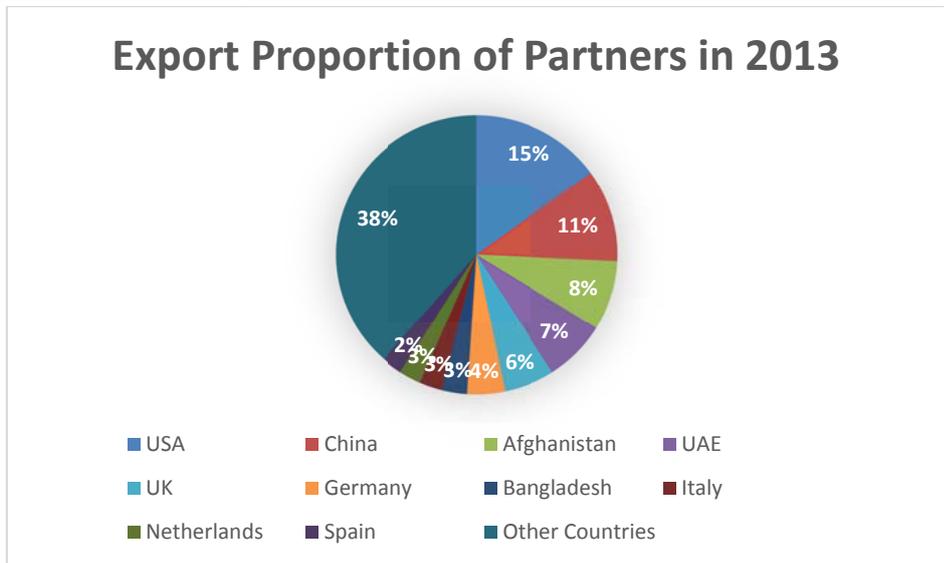
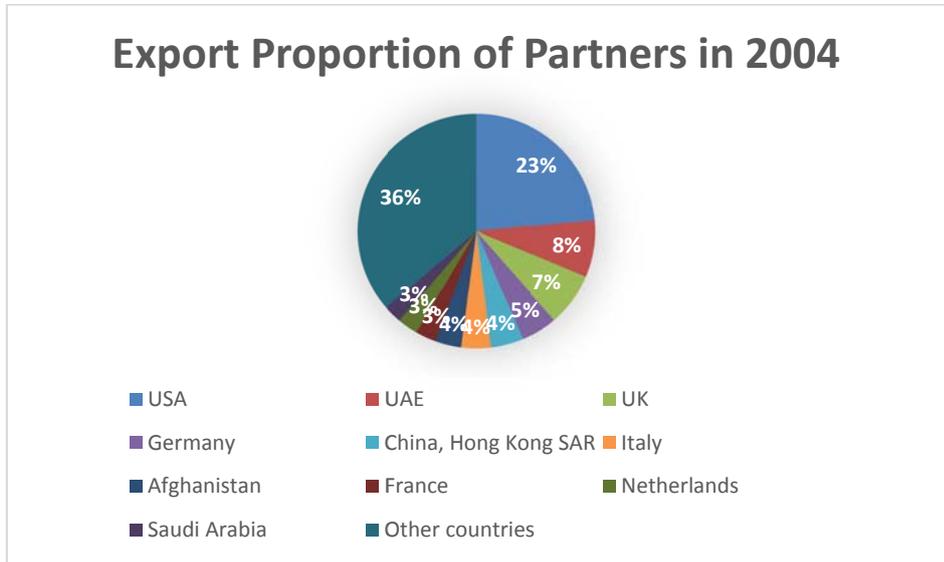


Figure 5

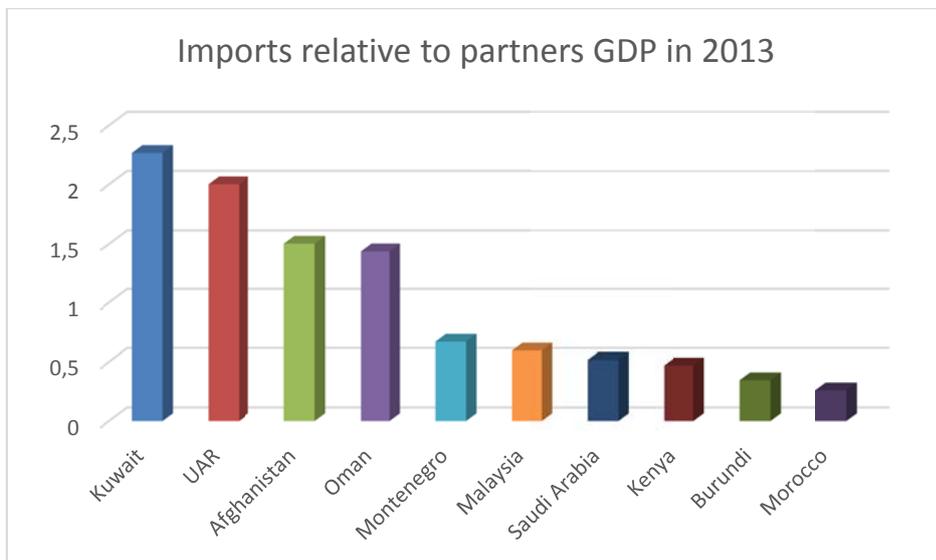
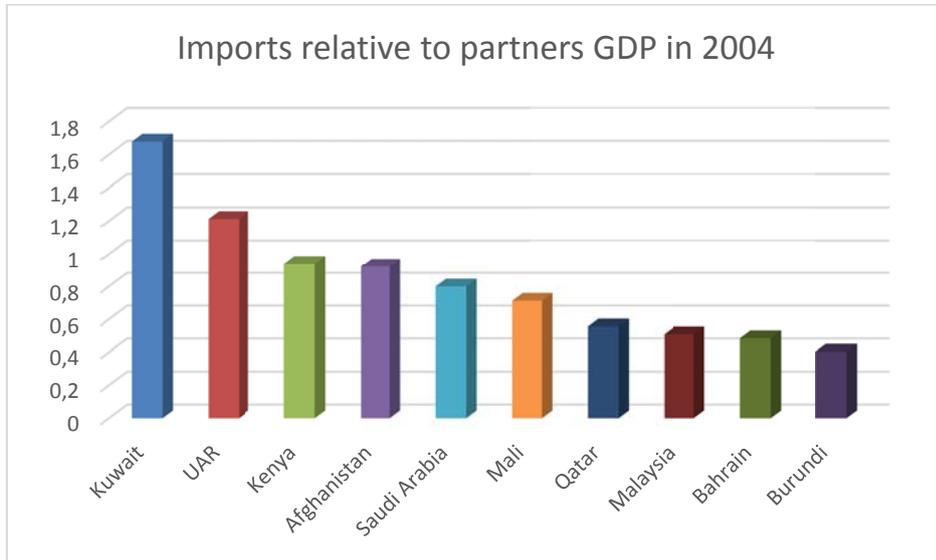


Figure 6

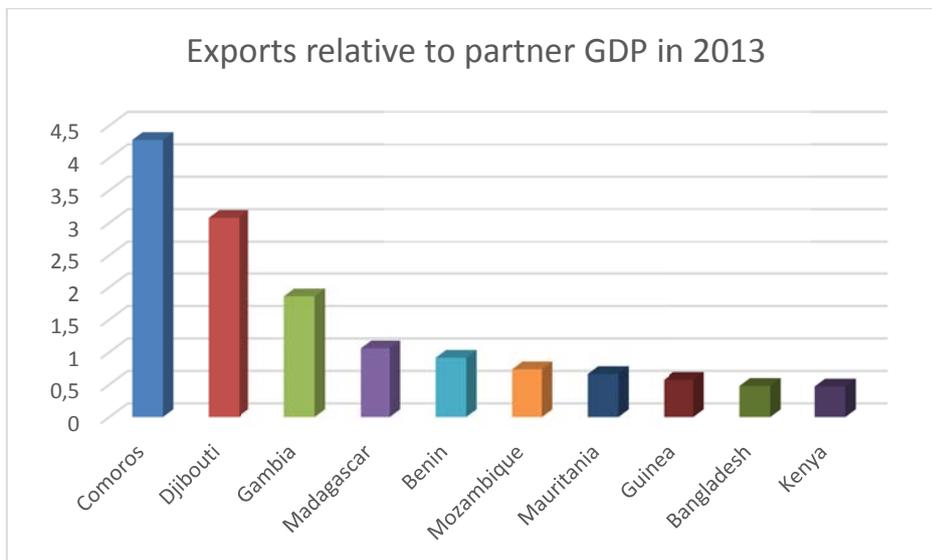
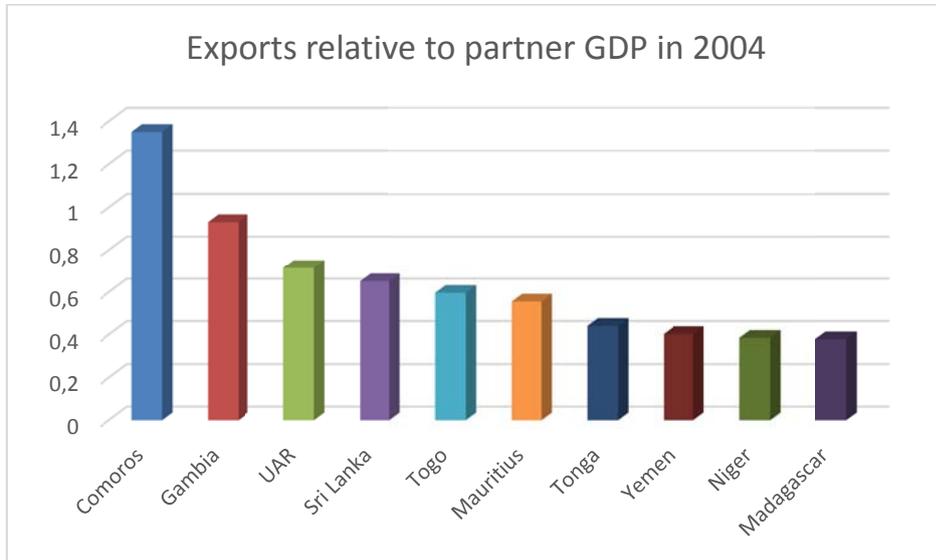


Table 1. Regressions Explaining Bilateral Imports

VARIABLES	1 OLS	2 OLS	3 EK-Tobit	4 PPML
ln_dist	-1.093*** (0.00841)	-1.505*** (0.00932)	-1.917*** (0.0137)	-0.597*** (0.0115)
pak_india	-4.043*** (0.143)	-5.035*** (0.194)	-7.064*** (0.194)	-1.747*** (0.143)
pak_china	-0.914*** (0.203)	-1.869*** (0.0919)	-3.068*** (0.138)	-1.063*** (0.0749)
pak_afg	1.414*** (0.105)	1.971*** (0.127)	3.068*** (0.388)	2.976*** (0.151)
pak_iran	-0.197 (0.242)	0.928*** (0.261)	1.351*** (0.253)	-0.228 (0.208)
contig	0.817*** (0.0369)	0.490*** (0.0390)	0.0975 (0.0606)	0.404*** (0.0268)
comlang_off	0.878*** (0.0170)	0.824*** (0.0177)	1.362*** (0.0258)	0.0951*** (0.0267)
comcol	0.892*** (0.0243)	0.822*** (0.0236)	0.906*** (0.0352)	0.558*** (0.0539)
rta	0.867*** (0.0163)	0.549*** (0.0169)	0.818*** (0.0237)	0.493*** (0.0216)
ln_reporterGDP	1.044*** (0.00260)			
ln_partnerGDP	1.264*** (0.00257)			
reporter dummies	No	Yes	Yes	Yes
partner dummies	No	Yes	Yes	Yes
year dummies	No	Yes	Yes	Yes
Observations	188,438	192,421	237,369	232,156
R-squared	0.680	0.758		0.861

Robust standard errors in parentheses

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

Table 2. Regressions Explaining Bilateral Exports

VARIABLES	1 OLS	2 OLS	3 EK-Tobit	4 PPML
ln_dist	-1.146*** (0.00858)	-1.597*** (0.00938)	-2.193*** (0.0140)	- 0.629*** (0.0105)
pak_india	-4.081*** (0.137)	-4.818*** (0.189)	-7.078*** (0.231)	- 1.469*** (0.151)
pak_china	-0.905*** (0.172)	-1.744*** (0.143)	-2.821*** (0.218)	- 0.674*** (0.0997)
pak_afg	1.810*** (0.212)	1.745*** (0.212)	2.186*** (0.369)	2.951*** (0.157)
pak_Iran	-0.733*** (0.213)	0.295 (0.257)	0.561** (0.241)	-0.0746 (0.194)
contig	1.132*** (0.0351)	0.669*** (0.0382)	0.0102 (0.0643)	0.506*** (0.0265)
comlang_off	0.882*** (0.0172)	0.867*** (0.0177)	1.491*** (0.0261)	0.136*** (0.0267)
comcol	0.824*** (0.0249)	0.674*** (0.0237)	0.978*** (0.0351)	0.408*** (0.0512)
rta	0.745*** (0.0167)	0.531*** (0.0170)	0.952*** (0.0247)	0.590*** (0.0216)
ln_reporterGDP	1.300*** (0.00294)			
ln_partnerGDP	0.901*** (0.00261)			
reporter dummies	No	Yes	Yes	Yes
partner dummies	No	Yes	Yes	Yes
year dummies	No	Yes	Yes	Yes
Observations	165,853	169,083	216,036	211,445
R-squared	0.650	0.749		0.870

Robust standard errors in parentheses

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