

The Determinants of Bangladesh's Imports: A Gravity Model Analysis under Panel Data

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Abstract:

This paper applies the generalized gravity model to analyze the Bangladesh's import trade with its major trading partners using the panel data estimation technique. Our results show that Bangladesh's imports are determined by the inflation rates, per capita income differentials and openness of the countries involved in trade. Also the country's imports are found to be influenced to a great extent by the border between India and Bangladesh. The country specific effects show that the influence of neighbouring countries is more than that of distant countries on Bangladesh's imports.

***Keywords:* Gravity Model, Panel Data, Bangladesh's Imports.**

***JEL Classification:* C23, F10, F14.**

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Analysis under Panel Data

I. Introduction

Foreign trade is an integral part of the total developmental effort and national growth of the Bangladesh economy. This is, in fact, a crucial instrument for industrialisation of the country as access to valuable foreign exchange is essential for sustained economic development.

However, the country suffers from a chronic deficit in her balance of payments. The trade relations of Bangladesh with other countries, especially with SAARC¹ countries, do not show any hopeful sign for the desirable contribution to country's economic development. The country's import payment is much higher than the export revenue. This has become a great concern to policy makers, politicians and the government of Bangladesh. Although several studies (e.g. Hassan 2000) are found with regard to trade relations and trade policies of Bangladesh, there is no particular in depth study which has explored the determinants of Bangladesh's import trade. This study, therefore, is an attempt to fill up this research gap.

To identify the major determining factors of Bangladesh's imports we have used panel data estimation technique and generalised gravity model. The main contributions of this paper are: it reaffirms a theoretical justification for using the gravity model in applied research of

¹ SAARC: South Asian Association for Regional Cooperation; member countries are Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka.

bilateral trade; it applies, for the first time, panel data approach in a gravity model framework to identify the determinants of Bangladesh's import trade.

The rest of the paper is organised as follows: section II presents a literature review that provides theoretical justification of the gravity model; section III analyses the Bangladesh's import trade using panel data and the gravity model; section IV provides sensitivity analysis of the model; and finally section V concludes the paper.

II. Literature Review: Theoretical Justification

The justification for the gravity equation can be analysed in the light of a partial equilibrium model of export supply and import demand as developed by Linneman (1966). Based on some simplifying assumptions the gravity equation turns out, as Linneman argues, to be a reduced form of this model.

Using a trade share expenditure system Anderson (1979) also derives the gravity model which postulates identical Cobb-Douglas or constant elasticity of substitution (CES) preference functions for all countries as well as weakly separable utility functions between *traded* and *non-traded* goods. The author shows that utility maximization with respect to income constraint gives *traded goods* shares that are functions of *traded goods* prices only. Prices are constant in cross-sections; so using the share relationships along with trade balance / imbalance identity, country j's imports of country i's goods are obtained. Then assuming log linear functions in income and population for traded goods shares, the gravity equation for aggregate imports is obtained.

Further justification for the gravity model approach is based on the Walrasian general equilibrium model, with each country having its own supply and demand functions for all goods. Aggregate income determines the level of demand in the importing country and the level of supply in the exporting country (Oguledo and Macphee 1994). While Anderson's (ibid.) analysis is at the aggregate level, Bergstrand (1985, 1989) develops a microeconomic foundation to the gravity model. He opines that a gravity model is a reduced form equation of a general equilibrium of demand and supply systems. In such a model the equation of trade demand for each country is derived by maximizing a constant elasticity of substitution (CES) utility function subject to income constraints in importing countries. On the other hand, the equation of trade supply is derived from the firm's profit maximization procedure in the exporting country, with resource allocation determined by the constant elasticity of transformation (CET). The gravity model of trade flows, proxied by value, is then obtained under market equilibrium conditions, where demand for and supply of trade flows are equal (Karemera *et al.* 1999). Bergstrand argues that since the reduced form eliminates all endogenous variables out of the explanatory part of each equation, income and prices can also be used as explanatory variables of bilateral trade. Thus instead of substituting out all endogenous variables, Bergstrand (ibid.) treats income and certain price terms as exogenous and solves the general equilibrium system retaining these variables as explanatory variables. The resulting model is termed a "generalized" gravity equation (Krishnakumar 2002).

Eaton and Kortum (1997) also derive the gravity equation from a Ricardian framework, while Deardorff (1998) derives it from a H-O perspective. Deardorff opines that the H-O

model is consistent with the gravity equations. As shown by Evenett and Keller (1998), the standard gravity equation can be obtained from the H-O model with both perfect and imperfect product specialization. Some assumptions different from increasing returns to scale, of course, are required for the empirical success of the model (Jakab *et al.* 2001). Economies of scale and technology differences are the explanatory factors of the comparative advantage instead of considering factor endowment as a basis of this advantage as in the H-O model (Krishnakumar 2002).

To test for the relevance of monopolistic competition in international trade Hummels and Levinsohn (1993) use intra-industry trade data. Their results show that much intra-industry trade is specific to country pairings. So their work supports a model of trade with monopolistic competition (Jakab *et al.* 2001).

Therefore, the gravity equation can be derived assuming either perfect competition or a monopolistic market structure. Also neither increasing returns nor monopolistic competition is a necessary condition for its use if certain assumptions regarding the structure of both product and factor market hold (Jakab *et al.* 2001).

Trade theories just explain why countries trade in different products but do not explain why some countries' trade links are stronger than others and why the level of trade between countries tends to increase or decrease over time. This is the limitation of trade theories in explaining the size of trade flows. Therefore, while traditional trade theories cannot explain the extent of trade, the gravity model is successful in this regard. It allows more factors to be

taken into account to explain the extent of trade as an aspect of international trade flows (Paas 2000).

III. Application of the Gravity Model in Analysing Bangladesh's Import Trade

A. Sample Size and Data

Our study covers a total of 35 countries. The countries are chosen on the basis of importance of trading partnership with Bangladesh and availability of required data. Five countries of *SAARC* (out of seven countries) –Bangladesh, India, Nepal, Pakistan and Sri Lanka- are included. We could not include Bhutan and the Maldives as these countries have no data for most of the years of our sample period. From the *ASEAN* countries, five countries- Indonesia, Malaysia, the Philippines, Singapore and Thailand- are included. From the *NAFTA*, three countries- Canada, Mexico and USA- are considered. Eleven countries are taken from the *EEC (EU)* group. These are Belgium, Denmark, France, Germany, Greece, Italy, the Netherlands, Portugal, Spain, Sweden and the United Kingdom. Six *Middle East* countries such as Egypt, Iran, Kuwait, Saudi Arabia, Syrian Arab Republic and the United Arab Emirates are taken in the sample. Five *other* countries-Australia, New Zealand, Japan, China and Hong Kong- are also included in our sample for the analysis of Bangladesh's trade.

The data collected for the period of 1972 to 1999 (28 years). We cannot go beyond this period because Bangladesh was born as an independent state in December, 1971. Similarly data on these countries after 1999 were not available when these were collected. All observations are annual. Data on GNP, GDP, GNP per capita, GDP per capita, population, inflation rates, total imports and CPI are obtained from the *World Development Indicators*

(*WDI*) database of the World Bank. Data on exchange rates are obtained from the *International Financial Statistics (IFS)*, CD-ROM database of International Monetary Fund (IMF). Data on Bangladesh's imports of goods and services (country *i*'s imports) from all other countries (country *j*) and Bangladesh's total trade of goods and services (exports plus imports) with all other countries included in the sample are obtained from the *Direction of Trade Statistics Yearbook* (various issues) of IMF. Data on the distance (in kilometer) between Dhaka (capital of Bangladesh) and other capital cities of country *j* (as the crow flies) are obtained from an Indonesian Website: www.indo.com/distance.

GNP, GDP, GNP per capita, GDP per capita are in constant 1995 US dollars. GNP, GDP, total exports, total imports, Bangladesh's exports, Bangladesh's imports and Bangladesh's total trade are measured in million US dollars. Population of all countries are considered in million. Data on the exchange rates are available in national currency per US dollar for all countries. So these rates are converted into the country *j*'s currency in terms of Bangladesh's currency (country *i*'s currency).

B. Methodology

The basic gravity model of trade simply describes that the trade flow between two countries is determined positively by each country's GDP, and negatively by the distance between them. This formulation can be generalized to

$$M_{ij} = KY_i^\beta Y_j^\gamma D_{ij}^\delta \quad (1)$$

where M_{ij} is the flow of imports into country i from country j , Y_i and Y_j are country i 's and country j 's GDPs and D_{ij} is the geographical distance between the countries' capitals.

The linear form of the model is as follows:

$$\text{Log}(M_{ij}) = \alpha + \beta \log(Y_i) + \gamma \log(Y_j) + \delta \log(D_{ij}) \quad (2)$$

Classical gravity models generally use cross-section data to estimate trade effects and trade relationships for a particular time period, for example one year. In reality, however, cross-section data observed over several time periods (panel data methodology) result in more useful information than cross-section data alone. The advantages of this method are: first, panels can capture the relevant relationships among variables over time; second, panels can monitor unobservable trading-partner-pairs' individual effects. If individual effects are correlated with the regressors, OLS estimates omitting individual effects will be biased. Therefore, we have used panel data methodology for our empirical gravity model of trade.

The generalized gravity model of trade states that the volume of imports between pairs of countries, M_{ij} , is a function of their incomes (GNPs or GDPs), their populations, their distance (proxy of transportation costs) and a set of dummy variables either facilitating or restricting trade between pairs of countries. That is,

$$M_{ij} = \beta_0 Y_i^{\beta_1} Y_j^{\beta_2} N_i^{\beta_3} N_j^{\beta_4} D_{ij}^{\beta_5} A_{ij}^{\beta_6} U_{ij} \quad (3)$$

Where Y_i (Y_j) indicates the GDP or GNP of the country i (j), N_i (N_j) are populations of the country i (j), D_{ij} measures the distance between the two countries' capitals (or economic centers), A_{ij} represents dummy variables, U_{ij} is the error term and β_s are parameters of the model. Using per capita income instead of population, an alternative formulation of equation (3) can be written as

$$M_{ij} = \beta_0 Y_i^{\beta_1} Y_j^{\beta_2} y_i^{\beta_3} y_j^{\beta_4} D_{ij}^{\beta_5} A_{ij}^{\beta_6} U_{ij} \quad (4)$$

Where y_i (y_j) are per capita income of country i (j). As the gravity model is originally formulated in multiplicative form, we can linearize the model by taking the natural logarithm of all variables. So for estimation purpose, model (4) in log-linear form in year t , is expressed as,

$$lM_{ijt} = \beta_0 + \beta_1 lY_{it} + \beta_2 lY_{jt} + \beta_3 ly_{it} + \beta_4 ly_{jt} + \beta_5 lD_{ijt} + \sum_h \delta_h P_{ijht} + U_{ijt} \quad (5)$$

where l denotes variables in natural logs. P_{ijh} is a sum of preferential trade dummy variables. Dummy variable takes the value one when a certain condition is satisfied, zero otherwise.

We have followed Frankel (1993), Sharma and Chua (2000) and Hassan (2000, 2001) to estimate our gravity model of imports. The model² is:

² Explanatory variables are selected on the basis of past literature and economic implications that affect import trade.

$$\begin{aligned}
\ln M_{ijt} = & \beta_0 + \beta_1 \ln Y_{it} + \beta_2 \ln Y_{jt} + \beta_3 \ln y_{it} + \beta_4 \ln y_{jt} + \beta_5 \ln D_{ijt} + \beta_6 \ln y_{dijt} + \beta_7 \ln ER_{ijt} + \beta_8 \ln \ln_{it} + \beta_9 \ln \ln_{jt} + \\
& \beta_{10} (\ln EX/Y)_{jt} + \beta_{11} (\ln TR/Y)_{it} + \beta_{12} (\ln TR/Y)_{jt} + \sum_h \delta_h P_{ijht} + U_{ijt}
\end{aligned} \tag{6}$$

Where, M = imports, Y=GDP, y = per capita GDP, D= distance, yd= per capita GDP differential, ER = exchange rate, In = inflation rate, EX/Y= export-GDP ratio, TR/ Y= trade-GDP ratio, P =preferential dummies. Dummies are: D1= j-SAARC, D2=j-ASEAN, D3= j-EEC, D4 = j-NAFTA, D5= j-Middle East, D6 = j- others and D7= border_{ij}, l= natural log.

Hypotheses

1. We expect positive signs for $\beta_1, \beta_2, \beta_8, \beta_{10}, \beta_{11}$ and β_{12} .
2. We expect negative signs for β_5, β_7 and β_9
3. Signs may be positive or negative for β_3, β_4 and β_6 . The reasons for ambiguity are: with the higher per capita income if the country i enjoys economies of scale effect, then β_3 would be negative; alternatively due to absorption effect if the country i imports more, then β_3 would be positive. Similarly, if country j demands more country j's goods due to higher income (absorption effect), β_4 would be negative; on the other hand, due to economies of scale effect in country j, if more goods are produced in country j, then β_4 would be positive. β_6 would be positive if the H - O hypothesis holds and negative if the Linder hypothesis holds.

In our estimation, we have used unbalanced panel data, and individual effects are included in the regressions. Therefore, we have to decide whether they are treated as fixed or as random. From the regression results of the panel estimation, we get the results of LM test and

Hausman test [in the REM of Panel estimation]. These results³ suggest that FEM of panel estimation is the appropriate model for our study.

There is, of course, a problem with FEM. We cannot directly estimate variables that do not change over time because inherent transformation wipes out such variables. Distance and dummy variables in our aforesaid models are such variables. However, this problem can easily be solved by estimating these variables in a second step, running another regression with the individual effects as the dependent variable and distance and dummies as independent variables,

$$IE_{ij} = \beta_0 + \beta_1 \text{Distance}_{ij} + \sum_h \delta_h P_{ijh} + V_{ij} \quad (7)$$

Where IE_{ij} is the individual effects.

C. Estimates of Gravity Equations, Model Selection and Discussion of results

Estimation and Model selection

The gravity model of Bangladesh's imports, the equation (6) above, has been estimated taking all variables except distance and dummy variables. The model covers all countries of our sample constituting 899 observations. In the estimation process only GDP_j , per capita GDP differential $_{ij}$, inflation $_i$, inflation $_j$, trade/GDP $_i$, trade/GDP $_j$ are found to be significant. All other variables are found either insignificant or have wrong signs. While multicollinearity of these variables is being tested, GDP_j variable is found to have problem. So omitting this variable from the model we are left with the five explanatory variables,

³ Results are not shown. However, these can be provided upon request.

where all variables are found to be significant with the correct signs. Therefore, our preferred estimated gravity model of imports is:

$$IM_{ijt} = \beta_0 + \beta_6 lyd_{ijt} + \beta_8 ln_{it} + \beta_9 ln_{jt} + \beta_{11}(TR/Y)_{it} + \beta_{12}(TR/Y)_{jt} \quad (6')$$

The detail results of the heteroscedasticity corrected model are shown in Table 1. The country specific effects of the heteroscedasticity corrected model are shown in Table 1(A). The estimation results of unchanged variables for equation (6) above -that is equation (7) - are noted in Table 2. The autocorrelated error structured model also gives similar results. All variables are tested for multicollinearity; the model does not have any multicollinearity problem⁴.

Discussion of Results

In the model, the intercept terms α_{0i} and β_{0i} are considered to be country specific, and the slope coefficients are considered to be the same for all countries. Per capita GDP differential has positive sign which supports the H – O hypothesis (see Table 1). With 1% increase of this variable, imports of Bangladesh increase by 0.69%. Imports of Bangladesh are also positively responsive with the inflation of Bangladesh and negatively responsive with the inflation of country j. The inflation elasticities of imports are 0.08 and –0.15 respectively for Bangladesh and country j. The openness variables of Bangladesh and country j are also major determining factors of Bangladesh’s imports. Both variables are highly significant and have positive influences on Bangladesh’s imports. The estimated

⁴ The results of autocorrelated error structured models, multicollinearity tests, descriptive statistics and correlation matrices are not shown. However, these can be provided upon request.

results show that with 1% increase of trade-GDP ratio of Bangladesh, other things being equal, has an effect of 29.37% increase of its imports [$\exp(3.38)=29.37$]. An increase of 1% trade-GDP ratio of country j leads to increase of 1.79% imports of Bangladesh [$\exp (.58) = 1.79$]. So liberalization of trade barriers from both sides is essential.

[Insert Table 1 and 1(A) here]

In terms of country specific effects, all effects except China are significant [see Table 1 (A)]. From the estimated results it is observed that Bangladesh's import propensity is the lowest from Portugal followed by Greece, Singapore, Belgium, Spain, etc., and it is the highest from India followed by China (not significant), Nepal, Pakistan, USA, Indonesia, etc.

The goodness of fit of the model, $R^2 = 0.79$, and $F [38, 860]= 87.37$. Also there is no multicollinearity problem among the explanatory variables. The autocorrelated error structured model also gives more or less similar results with regards to magnitudes and signs.

Table 2 refers to the effects of distance and dummy variables on the Bangladesh's imports. Only border dummy is found to be significant at 5% level. The coefficient value is 1.68 which indicates that Bangladesh's import trade with India is 5.37 times higher just because of common border [$\exp(1.68) = 5.37$].

[Insert Table 2 here]

IV. Sensitivity Analysis of the Model

For the sensitivity analysis of the gravity model the methodology of Levine and Renelt (1992) and Yamarik and Ghosh (2005) is followed. With the help of extreme –bounds sensitivity analysis the robustness of coefficient estimates can be tested. In the sensitivity analysis, three kinds of explanatory variables are generally identified. They are labelled as **I** variables, **M** variables and **Z** variables. **I** is a set of variables always included in the regression (set of core variables), **M** is the variable of interest, **Z** is a subset of variables chosen from a pool of variables identified by past studies as potentially important explanatory variables. So if T denotes bilateral import trade, the equation for the sensitivity analysis of the gravity model of trade would be as follows:

$$T = \beta_0 + \beta_i I + \beta_m M + \beta_z Z + u \quad (8)$$

where u is a random disturbance term.

In the sensitivity analysis, first a “base” regression for each M variable is run including only the **I** –variables and the variable of interest as regressors. That is, the above equation (10) is estimated for each **M** variable imposing the constraint $\beta_z = 0$. Then regression is made of T on the **I**, **M** and all **Z** variables (or all estimating combinations of the **Z** variables taken two at a time) and identification is made of the highest and lowest values for the coefficient on the variable of interest, β_m , which is significant. Thus these are defined as the extreme upper and lower bounds of β_m . If β_m remains significant and of the same sign at each of the

extreme bounds, then a fair amount of confidence can be maintained in that partial correlation, and thus the result can be referred to as “robust”. If β_m does not remain significant or if it changes sign at one of the extreme bounds, then one might feel less confident in that partial correlation, and thus the result can be referred to as “fragile”.

Estimation Strategy

The estimation strategy must account for the cross-sectional and time-series information in the data in order to make optimal use of the available data. One approach could be that all the observations would be treated as equal and a pooled model would be estimated using OLS. A constant coefficient across time is the requirement for this strategy. An alternative approach could be that one could allow for country-pair heterogeneity in the regression, and this heterogeneity could be incorporated either through bilateral country-specific effects or individual country-specific effects. However, through the inclusion of country specific effects one cannot estimate many time-invariant variables like distance, common border, etc. Since the objective for sensitivity analysis is to test the robustness of the variables, including those that are time-invariant, the first estimation strategy⁵ was therefore chosen.

Results of the Sensitivity Analysis

The results of the sensitivity analysis have been presented in Table 3. There are 6 variables of interest in the Import Model. For each variable, three regression results are reported. These are the base model, the extreme upper bound and the extreme lower bound. The regression results include the estimated coefficient (estimated β_m), the t-statistics, the R-

⁵ Yamarik and Ghosh (2005) also followed this strategy.

squared and the controlled variables, Z , included in each regression. The Extreme Bound Analysis result- fragile or robust- of each variable of interest is reported in the last column. It is found that all variables, except $(\text{Trade}/\text{GDP})_i$ and Border_{ij} , are robust .

[Insert Table 3 here]

V. Conclusion

We have established that the application of the gravity model in applied research of bilateral trade is theoretically justified. There are wide ranges of applied research⁶ where the gravity model is used to examine the bilateral trade patterns and trade relationships.

Our results show Bangladesh's imports are determined by the inflation rates, per capita income differentials and openness of the countries involved in trade. Exchange rate, on the other hand, has no influence on Bangladesh's imports. The country specific effects imply that neighbouring countries have greater influences on Bangladesh's imports. Also Bangladesh's import is found to be influenced to a great extent by the border between India and Bangladesh. However, per capita income differential supports the H-O hypothesis over the Linder hypothesis. This is somewhat contradictory result obtained from the country specific effects. It may be the case that per capita income differential is not the proper representation of the factor endowment differential. Also the H-O hypothesis assumes zero transportation cost and perfect competition which are unrealistic.

⁶ see Bergstrand (1985, 1989), Koo and Karemera (1991), Oguledo and Macphee (1994), Zhang and Kristensen (1995), Le et. al (1996), Frankel (1997), Rajapakse and Arunatilake (1997), Karemera et. al (1999), Mathur (1999), Sharma and Chua (2000), Paas (2000), Hassan (2000, 2001), Jakab et. al (2001), Kalbasi (2001), Martínez-Zarzoso and Nowak-Lehmann D (2002), Soloaga and Winters (2001), Christie (2002), Carrillo and Li (2002), Egger and Pfaffermayr (2000), and Mátyás et. al (2000).

The policy implications of the results obtained are that tight monetary and fiscal policy must be undertaken to reduce domestic inflation as it positively influences the country's imports. The country should be more open with regard to import of capital goods which in turn would increase the export capacity. Attempts must be undertaken to increase the Bangladesh's exports especially to the neighbouring countries like India. To this end exports must be diversified and price competitive with improved quality to get access in these markets.

Table 1: Hetero Corrected Fixed Effects Models with Group Dummy Variables.

Variables	Import Model
(TR/GDP) _i	3.38 (9.40)
(TR/GDP) _j	0.58 (6.97)
Log (PCGDPD _{ij})	0.69 (6.87)
Log (Infl _i)	0.08 (2.46)
Log (Infl _j)	-0.15 (-3.24)
R ²	0.79
F	87.37[38,860]
Observations	899

t-ratios are noted in parentheses.

Table 1 A: Country Specific Effects:

Estimated Fixed Effects

Country	Coefficient	t-ratio
India	.59693	3.75412
Nepal	-.63586	-4.92411
Pakistan	-.86768	-3.91459
Sri Lanka	-2.02300	-8.22451
Indonesia	-1.45216	-5.55482
Malaysia	-2.37158	-7.26383
The Philippines	-2.73135	-9.42516
Singapore	-3.59527	-8.33553
Thailand	-1.80805	-5.94157
Canada	-2.07663	-5.04592
Mexico	-3.07308	-8.81888

USA	-1.44102	-3.34354
Belgium	-3.53605	-8.49176
Denmark	-2.84402	-6.40894
France	-2.45038	-5.75066
Germany	-2.09445	-4.69577
Greece	-3.60681	-9.15776
Italy	-2.74619	-6.67274
The Netherlands	-2.65128	-6.36544
Portugal	-3.91391	-10.21942
Spain	-3.30586	-8.21573
Sweden	-2.70006	-6.34331
United Kingdom	-1.89176	-4.61686
Egypt	-2.46892	-8.95812
Iran	-2.04850	-6.52422
Kuwait	-3.12937	-7.74684
Saudi Arabia	-2.16190	-5.74465
Syrian A.R.	-2.85223	-9.91274
U.A.E	-2.45280	-5.74590
Australia	-2.04959	-4.92444
New Zealand	-3.19077	-7.73325
Japan	-1.55073	-3.50440
China	0.00304	.02090
Hong Kong	-3.13849	-2.53261

Table 2: Cross-Section Results of the Distance and Dummy Variables. Dependent Variable is Country Specific Effect.

Variables	Import Model
Distance	-0.56 (-0.71)
ijBorder	1.68 (1.89)
J-SAARC	0.75 (0.30)
J-ASEAN	0.47 (0.02)
J-EEC	-0.27 (-0.09)
J-NAFTA	0.48 (0.15)
J-Middle East	-0.84 (-0.03)
J- others	0.53 (0.18)
R ²	0.47
F	3.24[7,26]
Observations	34

t-ratios are shown in the parentheses.

Table 3: Results of the Extreme Bounds Sensitivity Analysis

Variable of Interest		Coefficient	t-statistic	R²	Control Variable(s)	Results
log(PCGDPD _{ij})	High	0.3331	12.15	0.53	Border _{ij} , (TR/GDP) _i	robust
	Base	0.3033	11.45	0.53		
	Low	0.1476	4.64	0.57	log(Infl _i), (TR/GDP) _j	
log(Infl _i)	High	0.1011	2.13	0.50	(TR/GDP) _i , log(Infl _i)	robust
	Base	0.0677	1.40	0.46		
	Low	0.0684	1.53	0.54	Border _{ij} , (TR/GDP) _j	
log(Infl _j)	High	-0.3315	-6.80	0.57	(TR/GDP) _j , log(PCGDPD _{ij})	robust
	Base	-0.4616	-9.02	0.50		
	Low	-0.4785	-9.28	0.51	Border _{ij} , log(Infl _i)	
(TR/GDP) _i	High	0.9522	1.28	0.52	log(PCGDPD _{ij}), log(Infl _i)	fragile
	Base	0.5000	0.64	0.46		
	Low	0.0071	0.01	0.50	Border _{ij} , log(Infl _i)	
(TR/GDP) _j	High	0.4191	12.60	0.54	Border _{ij} , (TR/GDP) _i	robust
	Base	0.4062	12.35	0.54		
	Low	0.2507	6.29	0.57	log(PCGDPD _{ij}), log(Infl _i)	
Border _{ij}	High	0.5910	4.41	0.56	log(PCGDPD _{ij}), log(Infl _i)	fragile
	Base	0.0422	0.30	0.46		
	Low	0.0422	0.30	0.46	(TR/GDP) _i , log(Infl _i)	

*Significant at 10% probability level

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