The Bangladesh Development Studies
Vol. XXXIII, December 2010, No.4

Democracy and Trade Balance: A Vector Autoregressive Analysis

M. ZAKIR SAADULLAH KHAN
M. ISMAIL HOSSAIN*

Democracy influences demand and supply pattern and the course of openness in international trade. Democratic governments promote market institutions which enhance trade. Democratic developing countries receive more foreign official resources and trade preferences which have impact on trade balance. This paper shows the empirical relationship between democracy and trade balance incorporating democracy index in the standard trade balance model. Using time-series data of Bangladesh and applying Vector Autoregressive technique, the study find a single cointegrating equation showing long-run stable relationship between trade balance and the explanatory variables. The study also finds convergence of short-run dynamics towards long-run equilibrium and concludes that democracy has a positive effect on the trade balance.

I. INTRODUCTION

Theoretical discussion on the relationship between democracy and trade indicates the existence of linkage between democracy and trade policy which promotes trade (Mayer 1984).[1] As democracy advances governments gradually move towards a trade policy which maximises welfare of the electorate comprising a large proportion of labour. At the micro level, democracy is hypothesised to promote trade, hence trade balance of a country favours creation of market institutions ensuring protection of private property, enforcement of contracts, transparent administrative procedures, and low levels of graft and bribery which lower transaction costs and minimise barriers to trade. When profit maximizing firms in a democratic nation seek to choose trading partners they prefer to trade with residents of a democratic nation which has higher probability of ensuring continuity of business practices and the rule of law (Souva, Smith and Rowan 2005).

* M. Zakir Saadullah Khan is Associate Professor, Department of Economics, Comilla University, Comilla, Bangladesh and M. Ismail Hossain is Professor, Department of Economics, Jahangirnagar University, Savar, Dhaka.

[1] Another strand of analysis indicates the existence of a negative linkage between democracy and pro-trade policy (e.g., Grossman and Helpman 1994).

There is another reason why democracy particularly in developing countries may enhance trade and favour trade balance. The trade pattern and flows of developing countries like Bangladesh depend heavily on the policies of the developed countries. The policy is mainly directed by the level of economic as well as political governance. The political freedom in a developing country determines to some extent, the trade concession or trade preference benefit receivable from the developed trade partners. If the trade preference boosts exports from the developing countries relative to imports, their trade balance improves. Thus the political process affects the trade pattern and the trade balance.

A growing number of empirical papers have examined the relationship between democracy and trade and found that democracy has a positive effect on trade (Dixon and Moon 1993, Morrow, Siverson and Tab eras 1998, Mansfield, Milner and Rosendorff 2000, Singer and Small 1994, Bliss an Russet 1998, and Lim and Decker 2007). The literature, however, overlooks the relationship between democracy and trade balance. The relationship is of interest particularly to new democracies as prolonged negative trade balance may be politically sensitive and can be used as an argument for anti-trade policies. This paper seeks to fill this vacuum in the literature.[2]

This paper augments the standard model of trade balance incorporating democracy variable for testing the causality between trade balance of Bangladesh and the democratic variable. This paper investigates the long-run stable relationship and short-run dynamics of the relationship between variables of the model using standard time-series econometric techniques for the data set of Bangladesh during the period 1973-2006.

The remainder of this paper is organised as follows. Section II discusses the theoretical foundation of the trade balance model. Section III describes the econometric methodology used for the present study as well as the data. Section IV tests the causal relationship between trade balance and the democratic variable and presents the results of the empirical analysis of the augmented model. Finally, conclusions are presented in Section V.

II. THEORETICAL FOUNDATION OF THE TRADE BALANCE MODEL

There are three approaches to explain the factors determining the trade balance. The elasticity approach focuses on the exchange rate as the major determinant of the trade

[2]. The only study is that of Bah and Amusa (2002), which finds that the democratic process and liberalisation policies adopted in the post-1994 period in South Africa have boosted her export performance and improved the trade balance position.

balance. The absorption approach to the trade balance stresses that an increase in home income relative to the income of trading partners would lower the trade balance due to increased demand for imports. In the monetary approach, devaluation decreases the real supply of money, resulting in an excess demand for money. This leads to hoarding and an improvement in the trade balance.

A single baseline model of trade balance is derived in this study that captures the effects of all the factors on trade balance as suggested by the three approaches and employed by some researchers (e.g., Krugman and Baldwin 1987, Rose and Yellen 1989, Rose 1991 and Baharumshah 2001). The model is derived from foreign (*j*) and domestic *(i*) countries' supply of exports and demand for imports under a broad range of assumptions. The demand for imported goods by country-*i* depends upon the relative price of imports and domestic real income

$$M^d_i = M^d_i(RP_{mi} , Y_i) \tag{1}$$

where M^d_i is the domestic demand for imports by country-*i*, RP_{mi} is the relative price of imported goods to domestically produced goods, and Y_i is the domestic real income. Let ER_{ji} be the nominal exchange rate[3], defined as the price of domestic currency in terms of foreign currency. The relative price of imported goods can be expressed as

$$RP_{mi} = \frac{P_{xj}}{ER_{ji}.P_i} = \left(\frac{P_j}{ER_{ji}.P_i} \right) \left(\frac{P_{xj}}{P_j} \right) = (RER_{ij}) RP_{xj} \tag{2}$$

where P_{xj} is the foreign currency price of foreign exports, P_i and P_j are the domestic (country-*i*'s) price indices and foreign (country-*j*'s) price indices of all goods respectively, RER_{ij} is the real exchange rate, defined as $RER_{ij} = [(1/ER_{ji})(P_j / P_i)]$, so that an increase in ER_{ji} signifies an appreciation of the home currency, and RP_{xj} is the relative price of foreign (*j*'s) exports of foreign produced goods.

Substituting RP_{mi} from Equation (2) into Equation (1) gives the following equation

$$M^d_i = M^d_i (RER_{ij}.RP_{xj} , Y_i) \tag{3}$$

Similarly, the foreign country's demand for imports depends upon foreign real income Y_j (or real income of the world, Y_w) and domestic relative export prices.

$$M^d_j = M^d_j (RP_{xi} / RER_{ij} , Y_j)$$

$$\text{or} \qquad M^d_w = M^d_w (RP_{xi} / RER_{ij} , Y_w) \tag{4}$$

[3] ER_{ji} is the nominal exchange rate defined as the number of units of foreign currency per unit of domestic currency.

Given that domestic exports are foreign (rest of the world) imports and vice versa, that is,

$$X^s_i = M^d_w \; ; \tag{5}$$

$$X^s_w = M^d_i \tag{6}$$

Following Haynes and Stone (1982), Bahmani-Oskooee (1991), Brada, Kutan and Su. Zhou (1997) and Shirvani and Wilbratte (1997), the domestic balance of trade of country-*i* (TB_i) can be expressed as the ratio of imports over exports (X_i/M_i), which, according to Bahmani-Oskooee (1991), is unit free and can be interpreted as nominal or real trade balance.

In addition, the exports - imports ratio allows focusing on the specific causes of trade imbalance between a country and its major trading partners. This helps utilise logarithm of the trade balance as the dependent variable in the empirical work.

$$TB_i = X_i/M_i = M^d_w / M^d_i = M^d_w (RP_{xi} / RER_{ij} \, , \, Y_w) \, / \, M^d_i \, (RER_{ij} \, . RP_{xw} \, , \, Y_i) \tag{7}$$

Equations (1) - (4) are structural equations that can be solved with (5) and (6), and substituted into (7). Assuming constant or stationary values of RP_{xi} and RP_{xj}, the resulting reduced-form equation can then be written as:

$$TB_i = TB_i(RER_{ij}, \, Y_i, \, Y_w) \tag{8}$$

This simple model of trade balance consists of three explanatory variables, trade balance (TB_i), real exchange rate (RER_{ij}), real domestic income (Y_i), and real foreign / world income (Y_w).

The vector of three explanatory variables affects the trade balance in a model that puts together (nets) the elasticity, absorption and monetary approaches. According to the *elasticity approach,* devaluation improves the trade balance by changing the relative prices between domestically and foreign sourced goods (expressed in the RER_{ij}). In the *absorption approach,* an exchange rate change can only affect the trade balance if it induces an increase in income which is greater than the increase in total domestic expenditure (absorption). Thus relative prices expressed by the RER_{ij} and income are primary determinants of trade balance behaviour. The *monetary approach* asserts that exchange rate changes have only temporary effects on the trade balance. Hence, there should be no long-run equilibrium relationship between the trade balance and exchange rates. With respect to income variable, the monetary approach assumes that an increase in income improves the trade balance, assuming that the Keynesian hypothesis of $0<MPC<1$ holds.

The current exchange rate regime of Bangladesh can be characterised as an adjustable basket peg system using a Real Effective Exchange Rate (*REER*) target.

It is observed that the real effective exchange rate as estimated on the basis of current par value significantly diverges from the desired or targeted *REER*; corrective response is initiated in the form of changing the nominal exchange rate. Therefore, it makes more sense to use the *REER* than *RER* in the empirical model to measure exchange rate, following the work of Rose and Yellen (1989), Rose (1991), Rincón (1998) and Bahmani-Oskooee (2001).

Trade in Bangladesh like that in many other developing countries is dependent on the developed countries through foreign official resources which finance imports as well as trade preferences/ concessions that facilitate exports. It is seen that the political system as well as the level of good governance of a particular country affects the decision of donors regarding aid flows and that of developed trading partners regarding bilateral trade policy. Usually the democratic governments of the LDCs with high degree of political freedom and civil liberty get more favourable treatment from their developed trading partners, while LDCs without democratic government or political and civil liberty might face greater trade barriers/restrictions. To investigate the effect of the level of political governance on the trade balance of Bangladesh, a variable called Democracy Index (*DEMO*) is incorporated in the model of Equation (8).

Therefore, the empirical model becomes:

$$TB_i = TB_i(REER\ ,\ Y_i\ ,\ Y_w\ ,\ DEMO) \tag{9}$$

Equation (9) expresses the balance of trade as a function of the real effective exchange rate (*REER*) and the levels of domestic (Y_i) and foreign incomes/world incomes (Y_w) and democracy index (*DEMO*).

III. METHODOLOGY AND THE DATA

III.1 The Econometric Model

The trade balance equation based on function (9) is expressed in log-linear form for estimation. For the long-run analysis, *DEMO* is considered exogenous and is taken as a dummy variable. According to the standard time-series model, the disturbance term (u_i) is assumed to be white-noise process. Adding time subscripts (t), the estimating equation of trade balance becomes:

$$ln(TB_i)_t = \alpha_0 + \beta_1 ln(REER)_t + \beta_2 ln(Y_i)_{t+} \beta_3\ ln(Y_w)_t + \beta_4\ (DEMO)_t + u_{it} \tag{10}$$

Equation (10) outlines the long-run relation among endogenous variables of the trade balance, which has been estimated taking *DEMO* as exogenous. The short-run dynamics has been incorporated by specifying equation (10) in an error-correction modelling format including the exogenous variable.

The variables in the model bear theoretically expected relationship with the trade balance. As devaluation in the elasticity approach improves the trade balance by changing the relative prices of domestically and foreign sourced goods, the sign of the co-efficient of *REER* (β_1) is expected to be positive if the Marshall-Lerner condition holds. In the absorption approach an exchange rate change can only affect the trade balance if it induces an increase in income greater than the increase in total domestic expenditure (absorption).

The coefficient (β_2) is expected to be negative/positive under the absorption / monetary approach. One of the effects of devaluation under the absorption approach is an income effect. This is related to both an increase in domestic output (income) and a change in the terms of trade. Both changes might increase absorption (consumption and investment) and then imports. This would worsen the trade balance. From the point of view of the monetary approach, " if…[an] economy is growing over time …. It will ceteris paribus run a …[trade balance] surplus" (Hallwood and MacDonald 1994). This is because of the implicit assumption that income growth raises expenditure by less than output, therefore, improving the trade balance. The variable Y_w is viewed as the foreign demand for domestic (Bangladesh) exports, and thus the coefficient β_3 is usually expected to be positive. *DEMO* is ranked higher for lower degree of democracy and lower for higher degree of democracy, so it is expected that the coefficient of the *DEMO,* β_4 be negative. Before running the empirical relationship, the study tests causal relationship between trade balance and democracy using Granger causality approach.

III.2 The Data

The data used to estimate the model consist of annual observations for Bangladesh for the period 1973-2006. After allowing for lags, the sample period for estimation of the model is 1977-2006. The data employed in this paper are obtained from *World Development Indicators* of World Bank, *International Financial Statistics* and *Direction of Trade Statistics of International Monetary Fund*. The data on *DEMO* is collected from the web page of Freedom House Survey (2007) database (http://www.freedomhouse.org). The value of the *Political Right* is considered as equivalent to the level of democratisation (*DEMO*).[4] Annex 1 presents the sources, definitions, and construction of the model variables of the study.

[4] Freedom House index of democracy is not above criticism like other indices of democracy available. But still it is widely used as a measure in empirical studies, since itq has the longest historical data and is comprehensive.

IV. EMPIRICAL ANALYSIS

IV.1 Test of Causality between Trade Balance and Democracy

This study examines the relationships between trade balance and democracy first, using Granger causality analysis for Bangladesh during the period 1973-2006. The Granger causality approach provides a plausible technique to consider both lagged and endogenous relationships. The order of lag is preset to three years in the Granger causality tests, as suggested by the Schwarz Information Criterion (SIC). Result (Annex 2) shows that democracy (*DEMO*) Granger-cause trade balance (TB) of Bangladesh, while no reciprocating evidence exists. The F-statistics from the tests does not reject the hypothesis of "TB does not Granger cause DEMO," but reject the hypothesis of "DEMO does not Granger cause TB" at 10% level of significance. This indicates there is one-way causality between democracy and trade balance, and democracy causes trade balance. Hence, inclusion of democracy in the equation explaining trade balance is justified.

IV.2 The Unit Root Test

The standard practice is to begin the empirical analysis by examining the time-series properties of the data. It starts with the test of stationarity of variables of the model (10), using unit root test procedures. The reason for knowing whether a variable has a unit root (that is, whether the variable is nonstationary) is that under the alternative hypothesis of stationarity, variables exhibit mean reversion characteristics and finite variance, and shocks are transitory and the autocorrelations die out as the number of lags grows, whereas under nonstationarity they do not. The standard ADF (Augmented Dickey-Fuller) test has been used to perform the unit root test in all the series of the model and examine their *order of integration.* The ADF test (a parametric statistic) controls for serial correlation directly. The ADF test used here includes a constant and a linear trend in the test regression since it has more general specification. The test has employed automatic lag length selection using a Schwarz Information Criterion (SIC) and a maximum lag length of 3. SIC is considered to be more appropriate because of small numbers of observations in the study (34 observations). Annex 2 and Annex 3 report the test statistics for the model without and with a time trend and intercept in level and in first differences respectively.

The estimated statistic for all the variables at level does not exceed ADF test statistics. It shows that the null hypothesis of unit root cannot be rejected at 5 per cent level of significance for all variables at level. To test for the presence of more than one unit root in all these variables, the unit root tests of the variables at first difference have to be checked. The results of Annex 3 show that the unit root hypothesis is rejected at the first differences for all variables.

This result from *Unit-root tests* provides strong evidence of non-stationarity at levels and stationarity at first difference and that all four series are integration of degree one, *I (1)*. The residuals are also found stationary at maximum 3 period time lag (Annex 4). Therefore, the implementation of the econometric procedure has been carried out on the assumption that all series exhibit nonstationary behaviour, in particular, that they behave as *I(1)* process.

IV.3 Trade Balance of Bangladesh in the Long Run

As the variables in the model are found non-stationary, the traditional methods cannot be used to estimate the model. In this case, to infer the long-run relationship among the variables, some form of co-integration analysis is required. The cointegration between variables reveals the existence of the stable long-run (equilibrium) relationship. To test for cointegration among the variables, Johansen Maximum Likelihood procedure has been applied to a vector autoregressive (VAR) version. It may be noted that this particular method is regarded as superior to the regression-based Engle and Granger procedure in testing cointegration among macroeconomic variables. The results are presented in Annex 2.

The Trace statistics rejects the null hypothesis of no cointegration at 5 per cent level, indicating that there exists a single cointegrating relationship among the variables of equation (10). Bottom part of Annex 4 shows the most significant cointegrating vector normalised on trade balance.

The parameter estimates representing the cointegration between the trade balance and the endogenous factors in the model is specified as:

$$ln(TB_i) + 9.849\ ln(REER) - 2.940\ ln(Y_i) + 0.078\ ln(Y_w) - 15.984 = 0$$

$$\text{or,}\quad ln(TB_i) = 15.984 - 9.849\ ln(REER) + 2.940\ ln(Y_i) - 0.078\ ln(Y_w) \qquad (11)$$

IV.4 The Error Correction Model (ECM)

With the existence of cointegration established, equation (10) is re-parameterised as an error correction model (ECM) to estimate a model for improved forecasting, including the effects of exogenous variables. The cointegrating equations are generally interpreted as the long run equilibrium relationships characterising the data, with the error correction equations representing short-run adjustment towards such equilibria. The error correction model alone also can make direct inference both about the long-run and short-run relationships. Since there is a single cointegrating equation, the VAR needs to include an error correction term involving levels of the series, and this term appears on the right-hand side of each of the VAR equations, which otherwise will be in first differences. Annex IV reports the error correction model for the trade balance

including the *DEMO* to capture the effects of democracy on trade balance of Bangladesh.

The estimated equation of the model in error correction form for trade balance is:

$$\Delta ln(TB_t) = - 0.679\Delta ln(TB_{t-1}) - 0.528\Delta ln(TB_{t-2}) - 0.387\Delta ln(TB_{t-3})$$
$$(-4.2548) \qquad (-2.5705) \qquad (-2.8455)$$

$$+1.061\Delta ln(REER_{t-1}) + 1.533\Delta ln(REER_{t-2}) - 0.030\Delta ln(REER_{t-3})$$
$$(3.2487) \qquad (1.5326) \qquad (-0.0973)$$

$$-3.051\Delta ln(Y_{t-1}) + 0.668\Delta ln(Y_{t-2}) - 0.004\Delta ln(Y_{t-3})$$
$$(-2.4810) \qquad (0.6055) \qquad (-0.0043)$$

$$+ 0.493\Delta ln(Y_{w\,t1}) + 0.546\Delta ln(Y_{w\,t-2}) - 0.348\Delta ln(Y_{w\,t-3}) - 0.070\ DEMO$$
$$(2.1964) \qquad (2.8399) \qquad (-1.7947) \qquad (-3.7885)$$

$$- 0.360\ [\ ln(TB_t) + 9.849\ ln(REER_t) - 2.940\ ln(Y_t) + 0.078\ ln(Y_{wt}) - 15.984\ ] \quad ....(12)$$
$$(-6.8221) \qquad (8.9358) \qquad (-5.5338) \qquad (0.2330) \qquad (-4.4884)$$

Numbers in parentheses represent the *t*-statistics for the respective coefficients. The coefficients of the short-run differenced estimation variables indicate that coefficients of all the *1*-period time lagged variables are significant at 5 per cent level, but the signs are opposite to long-run variables. This indicates that the effects of the explanatory variables of the model behave in the short-run in a reverse way. By period-3 the direction of their response on the trade balance has been changed and be adjusted with the long-run responses, though none of these are significant at 3- period lag, except the world income $Y_{w\,t-3}$.

The coefficient of the *REER* at 1 and 2 period time lags is positive and at 3 period lag it gets negative, indicating a deterioration of the trade balance immediately after a drop in the *REER,* which shows an improvement of the trade balance at 3 period lag. This is consistent with the *J*-curve phenomena revealing the existence of *J*-curve in the case of Bangladesh.

With respect to the domestic income variable, $Y_{i,}$ the trade balance of Bangladesh responds following a cyclical pattern, that is, deterioration in trade balance at 1-period time lag, improvement in the next period which is followed by deterioration. The immediate adverse effect of the rise in domestic income on trade balance of Bangladesh is consistent with the absorption approach: increased income increases the demand for importable, putting pressure on her trade balance. Later on rise in income expands domestic supply of exports more than rise in import and a positive effect results.

The effect of changes in world income (trade partners' income) $Y_{w,}$ on the trade balance of Bangladesh is positive in the beginning and negative from the 3rd period. This implies that Bangladesh's export to trade partners increase immediately after the increase in their income, which is consistent with the idea of the absorption approach and later it reverses.

The key finding from the short-run dynamics above is that of a negative and statistically significant speed of adjustment coefficient (the error correction term). This means that the speed at which the rate of variation of the trade balance Δ *ln(TBi),* the dependent variable in the first equation of the vector error correction (VEMC) system, adjusts towards the single long-run cointegrating relationship differs from zero. In other words, the equation for the trade balance Δ *ln(TBi)* contains information about the long-run relationship since the cointegrating vector does enter this equation. According to the estimates, short-run trade balance disequilibrium is corrected at the rate of 36% per annum.

IV.5 An Extension of the Long-run Relationship

Solving equation (12) the long-run relationship between the variables in the model can be written as (while all the Δs equal zero at equilibrium):

$$ln(TB_i) = 5.754 - 3.555ln(REER) + 1.058\ ln(Y_i) - 0.028\ ln(Y_w) - 0.070\ DEMO \quad (13)$$
$$(4.488)\ (8.936) \qquad (5.5338) \qquad (0.233) \qquad (3.789)$$

Here democracy index *DEMO* enters the equation as an exogenous variable. The equation reveals that the estimated coefficient of real effective exchange rate (*REER*) has a negative sign with high level of significance. Accordingly, a drop in the REER of Bangladesh or real devaluation leads to an improvement in the (real) trade balance. It indicates that a one per cent increase in the real exchange rate, keeping the other variables constant, leads to an average 3.55 per cent increase in the trade balance. Most products that Bangladesh exports and imports are responsive to exchange rate change. The high degree of responsiveness of REER on the trade balance of Bangladesh implies that change in *REER* significantly reduces import and increases export of Bangladesh and the trade balance presented by the ratio of the export over import got a large improvement. Thus, the elasticity approach or *Marshall-Lerner condition* seems to hold in the case of Bangladesh.

The positive sign of the estimated coefficient for Bangladesh's real income variable is consistent with the monetary view and is also statistically significant, denoting significant effect of the change in national income on the change of its trade balance in the long run. This implies that in the long run Bangladesh comparatively consumes more of its domestic goods, importing less. This improves the trade balance in the long-run. The

negative sign of the world income is also consistent with the monetary view, but it is not statistically significant.

The sign of the estimated coefficient of *DEMO* is negative and highly significant, implying that the democratic progress of Bangladesh improves its trade balance in the long run. The low value of democracy index represents high degree of democracy that improves trade balance of a country like Bangladesh.

V. CONCLUSION

Investigating the impact of non-economic factors like democracy on macroeconomic variables has gained momentum in recent years. This paper investigates the impact of democratic process on the trade balance of Bangladesh. Taking account of important economic determinants of the trade balance in a standard trade balance model, this study adds democracy as another determinant, which is measured by political right and civil liberties. Then the model is estimated using standard time series econometric techniques, the vector autoregressive (VAR) method after testing the stationary of the data series and cointegration among variables of the model. The estimation results show that more democracy leads to an improvement in the trade balance of Bangladesh. One major policy implication of the result is that reform in political structures of developing countries like Bangladesh that leads to an improvement in political rights and civil liberties brings about an improvement of the trade balance.

REFERENCES

Bah, I. and H. A. Amusa. 2002. "Real Exchange Rate Volatility and Foreign Trade: Evidence from South Africa's Exports to the United States." Discussion paper, School for Economic Sciences, University of Pretoria, South Africa.

Baharumshah, A. Z. 2001. "The Effect of Exchange Rate on Bilateral Trade Balance: New Evidence from Malaysia and Thailand." *Asian Economic Journal*, 15 (3): 291-312.

Bahmani-Oskooee, M. 1986. "Determinants of International Trade Flows - The Case of Developing Countries." *Journal of Development Economics*, 20: 107-123.

_____ 1991. "Is there a Long-run Relation between the Trade Balance and the Real Effective Exchange Rate of LDCs?" *Economic Letters*, 36:403-407.

_____ 1995. "Real and Nominal Effective Exchange Rates for 22 LDCs:1871.1-1990.4." *Applied Economics,* 27:591-604.

_____ 2001. "Nominal and Real Effective Exchange Rates of Middle Eastern Countries and their Trade Performance." *Applied Economics*, 33:103-111.

Bangladesh Bank: Bangladesh Bank Website: www.bangladesh-bank.org

Bliss, Harry & Bruce Russett. 1998. "Democratic Trade Partners: The Liberal Connection, 1962-1989." *Journal of Politics*, 60(4): 1126-1147.

Brada, Josef C., A.M. Kutan and Su Zhou. 1997. "The Exchange Rate and the Balance of Trade: The Turkish Experience." *Journal of Development Studies*, 33(5): 675-692.

Decker, Jessica Henson and Jamus Jerome Lim. 2007. "Democracy and Trade: An Empirical Study." MRPA Paper No. 6077. The World Bank.

Duc, Cindy, Granger Clotilde and Siroën Jean-Marc. 2004. "Trade and Democracy: An Empirical Investigation." Presented at AFSE Congress , Paris, September 2004.

Freedom House Survey. 2007. *Freedom House Survey* (http://www. freedomhouse.org).

Haernan, Rincon C. 1998. "Testing the Short–and–Long–Run Exchange Rate Effects on Trade Balance–The Case of Colombia." PhD dissertation, University of Illinois. (http://www.banrep.gov.co/docum/ftp/borra120.pdf)

Hallwood, C. P. and R. MacDonald. 1994. *International Money and Finance*, 2nd ed. Oxford: Blackwell.

Haynes, Stephen E. and Joe A. Stone. 1982. "Impact of the Terms of Trade on the U.S. Trade Balance: A Re-examination." *The Review of Economics and Statistics*, 64: 702-706.

Hossain, Akhtar. 2002. "Exchange Rate Responses to Inflation in Bangladesh." IMF Working Paper, No. 02/166, International Monetary Fund.

IMF: *Direction of Trade Statistics*, 1975- 2007.

_____: *International Financial Statistics* (IFS) CD-Rom

_____: *International Financial Statistics* (IFS) Yearbooks

Krugman, Paul R. and R. E. Baldwin. 1987. "The Persistence of U.S. Trade Deficit" *Brookings Papers on Economic Activities* 1, 1-43.

Morrow, James D., Randolph M. Siverson & Tressa E. Tabares. 1998. "The Political Determinants of International Trade: The Major Powers, 1907-90." *American Political Science Review* 92(3), 649-661.

Morrow, James D., Randolph Siverson and Tressa Tabares. 1999. "Correction to: The Political Determinants of International Trade." *American Political Science Review* 93: 931-933.

Rose, A. K. 1991. "The Role of Exchange Rates in a Popular Model of International Trade. Does the 'Marshall- Lerner' Condition Hold?" *Journal of International Economics*, 30: 301-316.

Rose, A. K. and L. Yellen. 1989. "Is there a J-curve?" *Journal of Monetary Economics*, 24: 53-68.

Shirvani, H. and B. Wilbratte. 1997. "The Relationship between the Real Exchange Rate and the Trade Balance: An Empirical Reassessment." *International Economics Journal*, 11 (No. 1): 30-50.

Shen, Jian Guang. 2002. "Democratic Transformation and Economic Growth: An Alternative Empirical Approach." http://www.bof.fi/NR/rdonlyres/ AA441831-EC3A-40D7-A4FB-212BF8FADFDC/0/democracy.pdf

Souva, Mark, Dale L. Smith and Shawn Rowan. 2005. "Market Institutions and the Determinants of International Trade." Paper presented at the Annual Meeting of the Southern Political Science Association, New Orleans.

ANNEX 1

Sources, Definitions and Construction of Model Variables

Trade Balance (TB)

Trade Balance of Bangladesh is obtained by taking the logarithm of the nominal exports-imports ratio. Annual data series for both nominal exports and nominal imports for the period 1973 to 2006 are available from World Development Indicator *(WDI)* CD-Rom. The exports-imports ratio, following Haynes and Stone (1982), and Bahmani-Oskooee (1991), proxies for the trade balance. The ratio makes the data unit free and can be interpreted as nominal or real trade balance for the empirical model.

Real Effective Exchange Rate Index (REER)

Real Effective Exchange Rate for Bangladesh for the period 1973-2006 is calculated following the four steps method of Bahmani-Oskooee (1995). First, bilateral nominal exchange rates (*NER*) of Bangladesh (denoted by *'i')*, with its trading partner country, *j* are obtained by dividing Bangladesh-US $ exchange rate by respective trading partner currency-US $ exchange which are available from the IMF's *International Financial Statistics* (IFS) CD-Rom. Thus the bilateral exchange rates are:

$$NER_{ij} = NER_{i\$} / NER_{j\$}$$

Where, NER_{ij} stands for bilateral nominal exchange rate of Bangladesh with the trading partner *j*, $NER_{i\$}$ for Bangladesh's exchange rate with dollar and $NER_{j\$}$ for the trading partners' exchange rate with dollar.

The second step involves calculating the bilateral real exchange rates. This is based on the following equation:

$$RER_{ij} = NER_{ij} \ (CIP_j / CIP_i)$$

where CIP_j stands for the Consumer Price Index in country *j* (trading partner), CIP_i for country *i* (Bangladesh). It needs to convert the bilateral exchange rate into index form with a common base year. We take the base of 2000 = 100. Data for CIPs are collected from the IMF's *International Financial Statistics (IFS) Yearbooks* and from Bangladesh Bank website (www.bangladesh-bank.org), and then we processed some figures to convert it to 2000 base index.

The third step involves the calculation of the trade shares (Exports plus Imports) for each of the selected trading partner countries and the transformation of those shares into normalised weights. The share of each country in Bangladesh's total trade is calculated as a percentage. Country-specific annual data for Bangladesh's trade flows during 1973-2006 are drawn from various issues of IMF's *Direction of Trade Statistics.* For this purpose, trade with major 15 trading partners is considered which together represents about 70 per cent of Bangladesh's total trade flows for the period. However, the trade shares of individual countries with Bangladesh changed significantly over this period.

Once the trade shares have been calculated, they are transformed into normalised weights (α_{ij}) by dividing each country's trade shares by the sum of the trade shares of the combined such that the sum of all normalised trade shares equals one. We use such data set for each five-year period calculated by Hossain (2001).

Finally, *REER* is estimated according to the following formula:

$$REER = \sum \alpha_{ij} \, RER_{ij}$$

Bangladesh's Income (Y_i)

Real GDP is used as income of Bangladesh, data is obtained from the World Development Indicator *(WDI)* CD-Rom.

World Income Index (Y_w)

World income index refers to the real incomes of all Bangladesh's importers expressed as an index with 2000= 100. Following Bahmani-Oskooee (1986), it is calculated as

$$Y_w = \sum w_{ij} \, RGDP_j$$

where w_{ij} is the normalised weight of market j in Bangladesh's exports. Relevant data are obtained from various issues of IMF's *Direction of Trade Statistics.* We consider major 15 importers from Bangladesh, which together constitutes almost 50 -55 per cent of Bangladesh exports, and calculate their import shares to Bangladesh exports during the study period. As before, the calculated value is converted to normalised value. $RGDP_j$ refers to economy j's annual real gross domestic product.

Democracy Index (DEMO)

In this study democracy index is expressed by the value of the Political Right Indices of the Freedom House. They use some criteria and method to construct this index for all the countries in the world. The characters representing scores for each year are, from left to right, political rights and civil liberties. Each of this is measured on a one-to-seven scale, with one representing the highest degree of freedom and seven the lowest. Countries whose political rights and civil liberties fall between 1.0 and 3.0 are designated "free;" between 3.0 and 5.0 "partly free;" and between 5.0 and 7.0 "not free." The data of Bangladesh for the period of 1973-2006 is collected from the web page of Freedom House Survey (2007) database (http://www.freedomhouse.org).

ANNEX 2

GRANGER CAUSALITY TESTS BETWEEN TRADE BALANCE AND DEMOCRACY

Pair wise Granger Causality Tests
Sample: 1973 2006
Lags: 3

Null Hypothesis:	Obs	F-Statistic	Prob.
TB does not Granger Cause DEMO	31	1.01433	0.4036
DEMO does not Granger Cause TB		2.48024	0.0854

ANNEX 3

ADF STATISTICS FOR TESTING FOR UNIT ROOTS IN LEVEL, FIRST DIFFERENCES AND FOR RESIDUALS

Variables	***t-ADF** (with trend and intercept)*		
	Level	*1st difference*	*Residual*
$ln(TB_i)$	-3.130	-10.867***	-5.741***
ln(REER)	-3.446	-6.574***	-6.958***
$ln(Y_i)$	-0.039	-8.616***	-5.101***
$ln(Y_w)$	-2.159	-5.245***	-3.798***

*, ** and *** denote rejection of the unit root hypothesis at the 10%, 5% and 1% level of significance.

ANNEX 4

THE COINTEGRATION ANALYSIS

Sample (adjusted): 1977 2006
Included observations: 30 after adjustments
Trend assumption: No deterministic trend (restricted constant)
Series: LN_TB LN_REER LN_Y LN_YW
Exogenous series: DEMO
Warning: Critical values assume no exogenous series
Lags interval (in first differences): 1 to 3
Unrestricted Cointegration Rank Test (Trace)

Hypothesised No. of CE(s)	Eigen value	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.925120	112.9431	54.07904	0.0000
At most 1	0.529680	35.18695	35.19275	0.0501
At most 2	0.261575	12.55669	20.26184	0.4002
At most 3	0.108920	3.459633	9.164546	0.4985

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
1 Cointegrating Equation(s): Log likelihood 252.8025

Normalised cointegrating coefficients (standard error in parentheses)

LN_TB	LN_REER	LN_Y	LN_YW	C
1.000000	9.849106	-2.940023	0.078202	-15.98420
	(1.10221)	(0.53128)	(0.33558)	(3.56126)

* Parentheses report *t*-values.