

AN INVESTIGATION OF THE RELATIONSHIP OF EXTERNAL PUBLIC DEBT WITH BUDGET DEFICIT, CURRENT ACCOUNT DEFICIT, AND EXCHANGE RATE DEPRECIATION IN DEBT TRAP AND NON-DEBT TRAP COUNTRIES

Noor Alam

Finance Department, Government of Sindh, Karachi, Pakistan

Fauzia Md. Taib

National Higher Education Research Institute (IPPTN), Pulau Pinang,
Malaysia, Universiti Sains Malaysia

Abstract

One can treat budget deficit as the mother of public debt because appearance of the former usually leads to the creation of later. However, in case of external public debt *ceteris paribus* current account deficit and exchange rate depreciation also come into play and show their significant relationship with it. The literature shows mostly descriptive approach on the subject however this study designs a model wherein the relationship of external public debt with budget deficit, current account deficit, and exchange rate depreciation are empirically tested. The study is dichotomy that covers empirical analysis of panels of a group of six “Debt Trap Countries (DTC)” namely as, India, Indonesia, Nepal, Pakistan, Sri Lanka, and Thailand and eight “Non Debt Trap Countries (NDTC)” as Bangladesh, Fiji, Korea, Malaysia, Myanmar, Papua New Guinea, Philippines, and Singapore, of Asian Pacific Developing Countries (APDC). Findings showed a positive relationship of external public debt (EPD) with budget deficit (BD), current account deficit (CAD), and exchange rate depreciation (ERD). However, their strength of relationship varies in DTC and NDTC. A stronger coefficient of EPD, BD, and ERD indicated an explosive borrowing, a higher demand of external public debt, and heavy utilization of foreign exchange while a lower coefficient of CAD signaled for the diversion of borrowed funds towards adjustment in current account in case of DTC. Relatively a lower coefficient of EPD, BD, and ERD indicated less borrowing, less demand of debt, and less utilization of foreign exchange while a higher coefficient of CAD suggested that borrowed funds were not diverted towards adjustment in current account in NDTC. This signaled a prudent public debt

management in NDTC as compared to DTC. An empirical attempt under the ecology of dichotomy is the main contribution of this study.

Keywords: External public debt; budget deficit; current account deficit; exchange rate depreciation; debt trap.

1.0 Introduction

In current global scenario, the subject of public debt always remains a matter of debate because of its significant role towards the economy of the country. It is worth pondering to note that the level or size of public debt is linked with the levels of surplus or deficit in the national account that further depends on the objectives of the policy makers of the country. Usually, a certain level of debt always exists in public debt portfolio as in most of the cases the old debt is replaced with the new debt (Musgrave, 1984). A benevolent or a politically motivated government is more inclined towards the expansionary fiscal policy that leads to create deficit in the national budget. The government under such circumstances prefers to go for debt financing instead of any innovation in tax therefore the demand of debt (domestic/foreign) remains higher (Alam, 2012). In developing countries the government usually confronts with domestic resource crunch problem and faces budget deficit therefore the foreign borrowing is a routine feature.

Ghaus and Pasha (2000), document that the primary budget deficit and the real exchange rate depreciation play significant role towards change in debt to GDP ratio. While Barro (1979), discusses that when taxes are distortionary, debt can be used to smooth taxes and the associated distortions when the desired path of government expenditure is not smooth. Similarly, Angeletos (2002) argues that an increase in expenditure or a decrease in aggregate income compels the government to raise both the tax rate and the level of public debt, since it is desirable to smooth the extra tax burden intertemporally. Sobel et al. (2006) suggest that when an economy is operating below its potential capacity, the government should institute expansionary fiscal policy and the increase in budget deficit be financed through borrowing from either private domestic sources or foreigners. Thus, one can treat budget deficit as the mother of public debt because appearance of the former usually leads to the creation of later. However *ceteris paribus*, the roles of current account deficit and exchange rate depreciation are also highly significant towards public debt of a country especially in case of external or foreign debt.

The literature shows mostly descriptive approach on the subject however this study designs a model wherein relationship of external public debt with budget deficit, current account deficit, and exchange rate depreciation are empirically tested. Accordingly, this paper attempts to

investigate the relationship of external public debt with budget deficit, current account deficit, and exchange rate depreciation in debt trap and non-debt trap countries. The rest of the paper is organized as follows: section 2.0 includes a brief literature survey on public debt, budget deficit, current account deficit, and exchange rate depreciation; section 3.0 postulates hypotheses, conceptualizes research framework and describes methodology; section 4.0 discusses results and findings; and section 5.0 concludes the paper.

2.0 Literature Review

In this section, we adopt a snapshot option to cover the views of researchers on public debt, budget deficit, current account deficit, and exchange rate depreciation.

2.1 Public Debt

Conventionally, public debt may be defined as the sovereign borrowing from its own population, from foreign governments or from international institutions. Public borrowings are usually made on a national scale by central governments and at lower tiers of the government by provincial/state, regional, district and municipal administrative authorities. Government takes loans to fill the gap in budget when there appears a deficit in it.

The financial scholars agree on one point that a high level of public debt is the curse for the nation, as it can induce inflation. In literature the level of debt has been discussed in various contexts. For instance, Congdon (1987) discusses that developing country governments cannot borrow domestically as much as their developed country counterparts because savers know that their ability to service debt is constrained by taxpayer resistance. He further discusses that in developing countries, the primitive style of marketing, little liquidity and high transaction costs are the obstacles that shake the confidence of the investors towards government's securities. Therefore, the government has no option except to proceed for external borrowing when it faces the budget deficit. While, Aslam and Anwar (2000) observe that the problem of increasing foreign debt burden in South Asian countries led them to a rising trend in their debt to GDP ratio. Caselli, Giovannini, and Lane (1999) in case of OECD countries find that the primary fiscal balances and outstanding debt beside inflation, and growth are the important variables that play significant role in determining the debt dynamics.

2.2 Budget Deficit

Budget deficit is the excess of government expenditure and it appears because governments do not finance all expenditures through explicit use of taxes however it also opt for debt as a tool of one important alternative method of finance through the issuance and sell of bonds to the public. Tanzi

and Blejer (1988) document that fiscal deficits are pre-requisites for the accumulation of public debt, since usually the issue of government liabilities arises from the need to finance the gap between ordinary revenues and total expenditures. To finance the enlarged budget deficit, the government will have to borrow from either private domestic sources or foreigners (Sobel et al., 2006).

It is also unanimous in literature that budget deficit lowers the credit worthiness of the government because of expected inflationary trend in the economy. Under such circumstances, the procurement of debt becomes expensive as the investors demand risk premium on their investment. Resultantly, there is an upward pressure on interest payments thus in the absence of primary surplus in the budget, an increase in interest payments leads to further accumulation of debt.

2.3 Current Account Deficit

Current account balance summarizes a country's current transactions with the rest of the world that mainly includes trade in goods and services, net investment income, and net unilateral transfers. There are ample evidences from literature that indicate link between current account deficit and external debt. For instance, Rao et al. (1994) discuss that external borrowing is required to cover a deficit in the current account of a country's balance of payments. Edwards (2000) documents that current account position of a country is determined by the pace at which foreigners are intended to accumulate that country's financial liabilities. Stock (2000) observed that oil price hike of 1973-74 brought a massive shift of wealth from oil consuming countries to oil producing countries that plunged many of the former into large current account deficits. They tried generally to finance their incremental current account deficits by borrowing from international banks. Thus, in most of these countries, the current account deficit played significant role in raising the level of their external debt.

2.4 Exchange Rate Depreciation

An exchange rate is the value of one country's currency in terms of another country's currency i.e., the exchange of the number of units of currency between two countries. The depreciation in domestic currency against the foreign currency in which the debt is denominated appreciates the value of outstanding external debt in the same proportion and leads to capital loss in terms of domestic currency. If the trend in exchange rate depreciation is rapid then it will also increase the intensity of capital loss when a country goes to meet its external debt servicing obligation. Hence, the role of exchange rate is vital for a country in case of foreign debt.

Cavallo, et al. (2002) observe that the reasons for exchange rate overshooting is the size of foreign currency denominated debt of a country, sudden stop of capital flows and decrease in output in the domestic economy.

For many of the Heavily Indebted Poor Countries (HIPCs), their external debt is over two times their GNP and debt servicing eats up a large share of scarce foreign exchange (Asiedu, 2003). A positive growth in external debt means an increase in external debt servicing that leads to increase the demand of foreign currency thus there is a price escalation in the currency in which the debt is denominated. An appreciation in foreign currency in which the debt is denominated will increase the level of external debt in terms of domestic currency. In this context, Khor (1998) documents that because of the depreciation of the Malaysian ringgit between end-1996 and end-1997 its foreign debt shot up from RM 97.8 billion to RM 168.3 billion (a hefty 72 percent increase).

3.0 Hypotheses, Research Framework and Methodology

In light of the discussion in literature, the study proposes hypothesis as “*External public debt has a correlation with budget deficit, current account deficit, and exchange rate depreciation*”. We test our hypothesis under the setup of DTC and NDTC. Hence, our hypotheses are further stated under the dichotomy of DTC and NDTC as (i) *Budget deficit has a stronger positive relationship with external public debt in DTC than NDTC*; (ii) *Current account deficit has a stronger positive relationship with external public debt in NDTC than DTC*; (iii) *Exchange rate depreciation has a stronger positive relationship with external public debt in DTC than NDTC*.

In our model, budget deficit (BD), current account deficit (CAD), and exchange rate depreciation (ERD) are exogenous variables while external public debt (EPD) is endogenous. EPD includes public debt, publically guaranteed debt, and private non-guaranteed debt. BD is the overall deficit in national account; CAD is the deficit in transactions with foreign nations; and exchange rate depreciation ERD is implied for depreciation in domestic currency of a country against US dollar. EPD, BD, and CAD are in percentage of GDP whereas ERD is in absolute term. Secondary data (unbalanced) from Asian Development Bank Reports for a period of thirty years (1971 to 2000) are used.

We established the ecology of dichotomy by selecting two groups of fourteen, Asian Pacific Developing Countries (APDC). Firstly, a group of six countries categorized as “Debt Trap Countries” or shortly as “DTC” that includes India, Indonesia, Nepal, Pakistan, Sri Lanka, and Thailand. Secondly, a group of eight countries as “Non Debt Trap Countries” or “NDTC” which includes Bangladesh, Fiji, India, Korea, Malaysia, Myanmar, Papua New Guinea, Philippines, and Singapore. The groupings of countries into DTC and NDTC have been done on the basis of basic borrowing fundamentals (BBF) designed by Alam (2007 & 2012) also see Alam & Taib (2012a & 2012b).

In model, the benefit of autoregressive (dynamic) modeling has been taken as granted for using the option of lagged value(s) of the regressand as explanatory variable. Gujrati (2003) documents that the presence of a lagged dependent variable on the right-hand side of the equation implies that, the impact of the independent variables can be spread out over a number of time periods. We assume that the model is recursive and unidirectional wherein exogenous variable affects endogenous but the endogenous does not in return. We ran panel ordinary least square regressions with fixed and random effects modeling (FEM & REM respectively). E-Views 5.1 and SPSS 12.0 versions were used for running regressions and other tests.

We propose following mathematical modeling:

$$EPD = f(BD, CAD, ERD, EPD_{t-1})$$

$$\Delta \ln EPD_{it} = \alpha_{10} + \delta_{it} + \eta_{t1} + \beta_1 \ln EPD_{i,t-1} + \beta_2 \ln BD_{it} + \beta_3 \ln CAD_{it} + \beta_4 \ln ERD_{it} + \varepsilon_{lit} \quad (1)$$

Where, \ln is a natural logarithm, and;

$$\Delta \ln EPD = \ln EPD_t - \ln EPD_{t-1}$$

EPD = external public debt

BD = budget deficit

CAD = current account deficit

ERD = exchange rate depreciation

The model includes one lagged value of the dependent variable EPD and it portrays the time path of the dependent variable EPD in relation to its past value EPD (-1). ‘ α_{10} ’ is a constant, symbol ‘ β_n ’ is used for parameter where $n = 1, 2, \dots, n$, ‘ ε_{it} ’ is an error term, and ‘ i ’ indicates country-specific ‘ t ’ for time specific, ‘ δ_{it} ’ and ‘ η_{t1} ’ are country and time-specific error terms respectively and $i = 1, 2, \dots, N$, $t = 1, 2, \dots, T$, and $E[\delta_{it}] = 0$, $var[\delta_{it}] = \sigma_{\delta}^2$ and $cov[\varepsilon_{it}, \delta_{it}] = 0$; $E[\eta_{t1}] = 0$, $var[\eta_{t1}] = \sigma_{\eta}^2$, $cov[\varepsilon_{it}, \eta_{t1}] = 0$.

In recent studies, the fixed effects model (FEM) and the random effects model (REM) or error components model (ECM) are being used frequently for panel data analysis. Both of these models provide the solutions of heteroskedasticity and autocorrelation that are major issues in handling panel data. FEM is appropriate in situations where the individual-specific intercept may be correlated with one or more regressors. On the other hand, REM is appropriate in situations where the (random) intercept of each cross-sectional unit is uncorrelated with the regressors (Yaffee, 2003).

4.0 Results and Discussions

In panel data analysis heteroscedasticity and autocorrelation need special attention with reference to spatial (cross-section) and inter-temporal (time-series) data respectively. However, one cannot proceed without taking

initiative on unit root test for stationarity which is no doubt prerequisite for time-series data. Accordingly, we proceeded to test the stationarity first and then followed tests for heteroscedasticity and autocorrelation. However, the Granger causality test and the tests of equality were our additional efforts. The assumption of normality was relaxed on the ground that the data used were panel and large. The classical linear regression model (CLRM) does not require any assumption about the probability distribution of error-term especially in case of large sample. Without the normality assumption, Gauss Markov theorem showed that the OLS estimators are BLUE (Gujarati, 2003). Moreover, in our data no multicollinearity problem was observed among variables.

4.1 Unit Root Test

If a time series is stationary, its mean, variance, and autocovariance (at various lags) remain the same no matter at what time we measure them. In unit root test $p = 1$ indicates a unit root in stochastic variable and the time-series is known as a random walk time series which is no more stationary (Wooldridge, 2000; Gujarati, 2003). As mentioned earlier, the correction of non-stationarity problem is the precondition for the analysis of time series data. The recent literature suggests that panel-based unit root tests have higher power than unit root tests based on individual time series. E-views compute one of the five types of panel unit root tests: Levin et al. (2002), Im, Pesaran and Shin (2003), Fisher-type tests using ADF and PP tests, Maddala and Wu (1999), and Choi (2001), and Hadri (2000) as cited in E-View User's Guide. These tests are commonly termed as 'panel unit root' tests or multiple-series unit root tests that have been applied to panel data structures (where the presence of cross-sections generates 'multiple series' out of a single series).

When the non-transformed data were run, it depicted unit root problem that tempted to opt for running the transformed data as indicated in mathematical modeling. Table 1 shows the summaries of panel unit root tests. LLC, Breitung, IPSW, ADF, and PPF tests rejected the null hypothesis of unit root at one percent level.

Table 1. Summary of Panel Unit Root Tests

Method	Statistic
Levin, Lin & Chu t^*	-5.04***
Breitung t -stat	-4.58***
Im, Pesaran and Shin W -stat	-7.11***
ADF - Fisher Chi-square	105.08***
PP - Fisher Chi-square	231.12***
Hadri Z -stat	3.12***

*Note: *** Significant at 1 percent; ** Significant at 5 percent; *Significant at 10 percent*

4.2 Heteroscedasticity

The problem of heteroscedasticity is likely to be more common in cross-sectional than in time series data wherein the disturbances ‘ ε ’ appearing in the population regression do not have the same variance, (Gujarati, 2003). The researchers observe that heteroscedasticity can also occur in time series regression models that invalidate the usual standard errors, t statistics, and F statistics as in the cross-sectional case. Hence, most of the authors suggest the test for heteroscedasticity for larger samples however they recommend for small sample especially in case of time series if the error-terms are not serially correlated. If this would be the case then one has to rectify first the serial correlation and then proceed for the test of heteroscedasticity. The White test can also be run under such circumstances (Wooldridge, 2000). The T test of equality confirmed the presence of heteroscedasticity problem. Therefore, the White test has been run concurrently with OLS to erase the problem of heteroscedasticity.

4.3 Autocorrelation

The terms autocorrelation and serial correlation are synonymously used in the current literature (Gujarati, 2003). Although the incidence of autocorrelation is predominantly associated with time series data, it can occur in cross-sectional data (Wooldridge, 2000). In time series regressions, the common finding of correlation between residuals and their own lagged values violates the standard assumption of regression theory that disturbances are not correlated with other disturbances. The simplest and most widely used model of serial correlation is the first-order autoregression, or AR (1), model. If the AR (1) scheme is valid and the coefficient of autocorrelation is known, the serial correlation problem can be easily attacked by transforming the data following the generalized difference procedure (Gujarati, 2003).

The most popular method to detect autocorrelation is the Durbin Watson d statistic. Nevertheless, if there are lagged dependent variables on the right-hand side of the regression, the DW test is no longer valid. Under such circumstances, BG (Breusch & Godfrey) test, which is also known as LM (Lagrange Multiplier) test is followed. The test is based on the Lagrange Multiplier principle (Gujarati, 2003). The null hypothesis H_0 to be tested as there is no serial correlation of any order as follows:

$$H_0: \rho_1 = \rho_2 = \dots = \rho_p = 0$$

Since, our model was dynamic with lagged regressand variable (s) on the right hand side, therefore, DW statistics did not hold significance in terms of autocorrelation problem thus we ran LM tests. Autocorrelation problem existed in data however, when the LM test was run after transformations of the data then it depicted the position as at Table 2. The

test results rejected the null hypothesis at lag 1 showing that data were free of autocorrelation at lag 1. Thus, we used up to lag 1 of dependent variable on the right hand side to correct the autocorrelation problem.

Table 2. VAR Residual Serial Correlation LM Tests

Observations	Lags	LM-Stat	Prob.
228	1	2.01	0.16

4.4 Granger Causality Test

In dynamic (Autoregressive) modeling, the use of lag value of dependent variable raises the issue of causality in economic variables. Gujarati (2003) suggests Granger causality test with the following pair of regressions:

$$Y_t = \sum_{i=1}^n \alpha_i X_{t-i} + \sum_{j=1}^n \beta_j Y_{t-j} + u_{1t} \tag{2}$$

$$X_t = \sum_{i=1}^n \lambda_i X_{t-i} + \sum_{j=1}^n \delta_j Y_{t-j} + u_{2t} \tag{3}$$

In equations 2 and 3 under assumption, the disturbances u_{1t} and u_{2t} are uncorrelated and the variable under consideration does not “Granger cause” the other variable. One can reject the null hypothesis if the computed F value exceeds the critical F value at the chosen level of significance. The test results revealed a unidirectional causation at lag 1 indicating that all independent variables were strongly exogenous in characteristics as shown at Table 3.

Table 3. Results of Granger Causality Tests

	F-Stat	Prob.	Null Hyp.	Alt. Hyp.
At lag 1				
BD does not Granger Cause EPD	3.21	0.07	Rejected	Accepted
EPD does not Granger Cause BD	0.90	0.34	Accepted	Rejected
CAD does not Granger Cause EPD	18.15	0.00	Rejected	Accepted
EPD does not Granger Cause CAD	0.22	0.64	Accepted	Rejected
ERD does not Granger Cause EPD	4.03	0.05	Rejected	Accepted
EPD does not Granger Cause ERD	0.22	0.64	Accepted	Rejected

4.5 Hausman Test

The Hausman Test is used for the selection of FEM and REM. A significant result of this test advocates for the choice of REM and an insignificant result for FEM. However, Judge et al. ([1982]; as cited in Gujarati, 2003) suggest that if the data are composed of small N (cross-sectional elements) and large T (time series elements) then estimated parameters are identical in both cases therefore the choice would be based on

computational convenience. Taking advantage of it we ran FEM and REM both just to evade any biasness in our model as concomitantly it was providing us an avenue for sensitive check also for our model. The summary result of the test is shown at Table 4.

Table 4. Summary Results of Hausman Test

Test Summary	Chi-Sq. Stat	Chi-Sq. d.f.	Prob.
Cross-section random	8.65	3	0.03

4.6 Findings

Table 5 shows the summaries of main findings. A mix response was generated from FEM and REM however the direction of relationship of BD, CAD, and ERD with EPD remained same and it was positive. FEM reported equal strength of coefficient of BD in DTC and NDTC while REM showed a stronger coefficient of BD and ERD in DTC than NDTC while a weaker coefficient of CAD in NDTC than DTC. Under this situation, we preferred to follow the results of REM.

In DTC, a stronger coefficient of BD and EPD indicated a higher demand of external debt that was followed by an explosive borrowing, a highly significant ERD revealed heavy utilization of foreign exchange for servicing external debt; and strong coefficient of EPD and weak coefficient of CAD signaled for the diversion of borrowed funds towards the adjustments in current account. In NDTC, relatively lower coefficients of BD, ERD, and EPD in NDTC depicted lower demand of external debt, less borrowing, and less utilization of foreign exchange for servicing the external debt and weak coefficient of EPD and strong coefficient of CAD suggested that borrowed funds were not diverted towards adjustment in current account.

The results depicted quite a low R^2 however a low R^2 is not an issue as literature suggests that a high R^2 statistics does not hold any significance in time-series or larger data as under such cases a significant F stat is sufficient enough for the goodness of fit for the model. The F stat was found highly significant in our model.

Table 5. Summary of Regression Results

DV: D(LOG(EPD))	FEM		REM	
	DTC	NDTC	DTC	NDTC
Variable	Coefficient	Coefficient	Coefficient	Coefficient
C	0.36***	0.27**	0.37***	0.05
LOG(EPD(-1))	-0.17***	-0.11***	-0.15***	-0.06**
LOG(-BD)	0.04**	0.04***	0.052***	0.045***
LOG(-CAD)	0.02	0.06***	0.03**	0.07***
LOG(ERD)	0.06	0.01	0.03***	0.02*
R-squared	0.27	0.38	0.25	0.25
F-statistic	5.15	5.67	10.41	9.32
Prob (F-statistic)	0.00	0.00	0.00	0.00
Durbin-Watson stat	1.33	1.74	1.34	1.65

Note: *** Significant at 1 percent; ** Significant at 5 percent; *Significant at 10 percent

4.7 Equality Tests

In sub-section 4.7 we discuss the “Equality Tests” which are generally used to check the dichotomy that whether the two groups are identical or different. For this purpose, we chose interaction model test and Chow test. These tests are discussed individually as follows.

4.7.1 Interaction Model Test for Equality of Coefficients

It is a sort of dummy variable tests between 1 and 0 and the group is used as a moderator (i.e., makes an interaction) between original and dummy variables. We assumed 1 for DTC and 0 for NDTC. If the test result indicates a positive coefficient in interaction model it means the coefficient in DTC is higher in the original model and vice versa. Table 6 shows the summary of the regression result. The results suggested higher values of BD and ERD in DTC (although not significant) and a higher value of CAD in NDTC. The inconclusive evidence for BD and ERD tempted us to proceed for Chow test.

Table 6. Summary Results of Interaction Models

Variable	Coefficient	t-Statistic
GROUP?	0.024	0.279
GROUP?*LOG(-BD?)	0.005	0.171
GROUP?*LOG(-CAD?)	-0.071 ***	-2.648
GROUP?*LOG(ERD?)	0.005	0.312

Note: *** Significant at 1 percent; ** Significant at 5 percent; *Significant at 10 percent

4.7.2 Chow Test

This test is used for the equality of coefficients of two periods of time or two groups. Since, we used this test for debt trap (DTC) and non debt trap countries (NDTC) therefore the test involved the computation of F stat by using following formula derived from Gujarati (2003).

$$F = [(RSS_{ndtc} - RSS_{dte}) \div k] \div [(RSS_{dte}) \div (n_1 + n_2 - 2k)] \quad (4)$$

Where RSS_{ndtc} and RSS_{dte} are residual sum of squares for NDTC and DTC respectively, k is number of parameters; n_1 and n_2 are the number of observations in each group.

One can reject the null hypothesis that the two sets of regression coefficients are equivalent if $F \geq F_c$, where F_c is the critical F-value for k numerator, and $(n_1 + n_2 - 2k)$ denominator degree of freedom. Based on the above formula, the F value was computed as shown in Table 7. The computed F value was found to be greater than the critical values that indicated that the coefficients were statistically different.

Table 7. Results of Chow Test

Computed F value	Critical F value
21.04***	3.02***

Note: *** Significant at 1 percent; ** Significant at 5 percent; *Significant at 10 percent

The drawback of the Chow test is that it tests model without giving due consideration for individual variable in each model therefore results for multiple variables have to be interpreted with caution. The results of interaction model test emerged differently however the Chow test fully supported the predicted hypotheses. Conclusively, it seemed appropriate enough to follow the results of Chow test under the existing circumstances as it showed consistency with the results of REM and FEM both. Table 8 shows the status of hypotheses that emerged with reference to the outcome of the Interaction model and Chow test.

Table 8. Summary of Hypotheses

Hypothesis	DTC/NDTC (Interaction model)	DTC/NDTC (Chow test)
HI: Budget deficit has a stronger positive relationship with external public debt in DTC than NDTC.	Rejected	Accepted
HII: Current account deficit has a stronger positive relationship with external public debt in NDTC than DTC.	Accepted	Accepted
HIII: Exchange rate depreciation has a stronger positive relationship with external public debt in DTC than NDTC.	Rejected	Accepted

5.0 Conclusion

The objective of this paper was to investigate relationship of external public debt with budget deficit, current account deficit, and exchange rate depreciation in debt trap and non debt trap countries. We adopted an empirical approach under the ecology of dichotomy which is our the main contribution. REM and FEM both were used with the support of requisite diagnostic tests plus additional efforts of Granger Causality test and Equality tests were used to ensure robustness in results. Our findings reveal that external public debt is positively related to budget deficit, current account deficit and exchange rate depreciation in the panels of six DTC and eight NDTC. It support the arguments/recommendations of Pasha and Ghaus (1996), Ghaus and Pasha (2000), Wijnbergen (1989), Gurtner (2002), Reza, Siregar and Pontines (2005), Aristovnik (2006), and Bergsten (2007) on the subject. In DTC, the stronger coefficients of EPD, BD, and ERD indicate a higher demand of external debt and a weaker coefficient of CAD signals for diversion of borrowed funds towards adjustment in current account. In NDTC, relatively weaker coefficients of EPD, BD, and ERD depict a lower demand of external debt and a stronger coefficient of CAD reveals non-diversion of borrowed funds towards adjustment in current account. Findings suggest that budget deficit, current account deficit and exchange rate depreciation play significant role towards external public debt of a country. Therefore, the policy makers of the country should consider these factors while making decision on external borrowing. The size of budget deficit and current account deficit and intensity of depreciation in domestic currency

against debt denominated currency needs special attention. In this paper, we mainly focused on external debt and restricted to a group of fourteen Asian Pacific Developing Countries only. Future research on a larger group of developing as well as developed countries for external and internal debt is suggested. The time-series or a cross-section analysis of the individual country are also recommended.

References:

- Alam, N. (2007). Debt Trap, Debt Burden Shifting, and Welfare Loss: A Comparative Study on a Group of Fourteen Asian Pacific Developing Countries. Doctoral Dissertation, University Sains Malaysia.
- Alam, N. (2012). Debt Trap, Debt Burden Shifting, and Welfare Loss: A Comparative Study on a Group of Fourteen Asian Pacific Developing Countries. Lambert Academic Publishing, Germany, ISBN 978-3-659-11492-2.
- Alam, N., & Taib, Fauziah. (2012a). Debt Trap and Basic Borrowing Fundamentals: A Comparative Studies on a Group of Fourteen Asian Pacific Developing Countries, European Journal of Social Sciences, vol. 28 (1), 42-49.
- Alam, N., & Taib, Fauziah. (2012b). Debt Burden Shifting and Welfare Loss: A Comparative Studies on a Group of Fourteen Asian Pacific Developing Countries, European Scientific Journal, vol. 8 (26), 159-172.
- Angeletos, G-M. (2002). Fiscal policy with noncontingent debt and the optimal maturity structure. President and Fellows of Harvard College and the Massachusetts Institute of Technology, The Quarterly Journal of Economics.
- Aristovnik, A. (2006). Current account deficit sustainability in selected transition economies. University of Ljubljana, Faculty of Administration, Slovenia. Scientific affiliation: International economics, economics of EU, public sector economics, 24, 81-102.
- Asiedu, E. (2003). Debt relief and institutional reform: a focus on Heavily Indebted Poor Countries. Board of Trustees of the University of Illinois. The Quarterly Review of Economics and Finance, 43, 614-626.
- Asian Development Outlook. (1990). Asian Development Bank.
- Asian Development Outlook. (1996). Asian Development Bank.
- Asian Development Outlook. (1998). Asian Development Bank.
- Asian Development Outlook. (2001). Asian Development Bank.
- Aslam, M. C., & Anwar, S. (2000). Foreign debt, dependency, and economic growth in South Asia. Pakistan-Development-Review, 39, (4), 551-570.

- Barro, R. J. (1979). On the determination of the public debt. *Journal of Political Economy*, 87(5), Part I, 940-71.
- Bergsten, C. F. (2007). The Current Account Deficit and the US Economy. A Hearing Before the Budget Committee of the United States Senate Director, Peterson Institute for International Economics. Retrieved on 04, 21, 2007, from, website <http://www.google.com>.
- Caselli, F., Giovannini, A., & Lane, T. (1999). "Fiscal discipline and the cost of public debt service: Some estimates for OECD countries". Graduate School of Business, University of Chicago; Long Term Capital Management; and Policy Development and Review Department, IMF.
- Cavallo, M., Kisselev, K., Perry, F., & Roubini, N. (2002). Exchange Rate Overshooting and the Costs of Floating. mimeo, New York University.
- Chow, G. (1960). Test of Equality between Sets of Coefficients in Two Linear Regressions, *Econometrica* (pre-1986); 28, 3, 591-605.
- Congdon, T.G. (1987). "The link between budget deficits and inflation: Some contrast between developed and developing countries". In Boskin, M. J., Flemming, J. S. & Gorini, S. (Eds.). *Private Saving and Public Debt*. (pp. 72-91). New York, USA, Basil Blackwell.
- Edwards, S. (2000). Does the current account matter? Paper prepared for presentation at the NBER's conference on "Crisis Prevention", Florida, January 2001.
- E-View User's Guide. (2004). Quantitative Micro Software. LLC, Irvine CA, www.eviews.com
- Ghaus, A. F. A., & Pasha, H. A. (2000). Macroeconomic framework for debt management. Policy Paper, Social Policy and Development Centre, Karachi, Pakistan.
- Gujarati, D. N. (2003). *Basic Econometric*. fourth edition, McGraw-Hill, Inc.
- Gurtner, J. F. (2002). "Currency board and debt trap: Evidence from Argentina and relevance for Estonia". Centre for Economic Reform and Transformation, School of Management, Heriot-Watt University, Riccarton, Edinburgh, EH144AS, Discussion Paper 2002/04.
- Judge, G. G., Carter, R. H., Griffiths, W. E., Lutkepohl, H., & Lee, T. C. (1982). *Introduction to the Theory and Practice of Econometrics*. New York: John Wiley & Sons.
- Khor, M. (1998). How Malaysia avoided a debt trap? Third World Network, www.sunsonline.org/trade/other/martinAsia2.htm, 8/23/2004

- Levin, A., Lin, C. F., & Chu, C. –S. J. (2002). Unit root test in panel data: Asymptotics and finite-sample properties. *Journal of Econometrics*, 108, 1-24.
- Musgrave, R. A., & Musgrave, P.B. (1984). *Public Finance in Theory and Practice*. Singapore: McGraw-Hill.
- Pasha, H. A., & Ghaus, A. F. A. (1996). Growth of public debt and debt servicing in Pakistan. Research Report, Social Policy and Development Centre, Karachi, Pakistan.
- Rao, V. V. B., Dacuila, T. C., & Pau, W. Y. (1994). *Asean External Debt Perspectives*. Singapore: Times Academic Press.
- Reza Y., Siregar, Y. R., & Pontines, V. (2005). *External Debt and Exchange Rate Overshooting: The Case of Selected East Asian Countries*. Centre for International Economic Studies. Discussion Paper, No. 0520. International Macro and Finance Program. University of Adelaide Adelaide, Australia.
- Sobel, R. S., Stroup, R. L., Macpherson, D. A., & Gwartney, J. D. (2006). *Understanding Macroeconomics*. Singapore: Thomson South- Western.
- Stock, M. (2000). Country risk assessment and sovereign debt rescheduling. *The International Handbook of Corporate Finance*. New York: The Chartered Institute of Bankers.
- Tanzi, V., & Blejer, M. I. (1988). “Public debt and fiscal policy in developing countries”. In Arrow, J. K., & Boskin, M. J. (Eds.). *The Economic of Public Debt*. (pp. 230-263). London, International Economic Association.
- Wijnbergen, V. S. (1989). External debt, inflation and the public sector: Towards fiscal policy for sustainable growth. *World Bank Economic Review*, 3, (3).
- Wooldridge, J. M. (2000). *Introductory Econometrics: A Modern Approach*. South Western College Publishing Thomson Learning.
- Yaffee, R. (2003). A primer for panel data analysis. (1 of 11) 11/5. 2003,10:09:21AM.http://www.nyu.edu/its/pubs/connect/fall03/yaffee_primer.html