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An exploratory study on impact of macroeconomic variables on current account deficit

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Abstract

The present paper is an endeavor to analyse the impact of macroeconomic variable on current account deficit. The present study is purely based on secondary data covering 15 financial years from 2000-01 to 2014-15. The analysis of which was made through the application of Karl Pearson's coefficient of Correlation and Multiple Regression. The study found that exchange rate accounts for 18% variations and external debt accounts for additional 53% variation in the outcome variable. It was further indicated through the results that if all the selected independent variables remain constant, then there are other factors which explain current account deficit up to 3243.382 units.

Keywords: Current account deficit, external debt, exchange rate

1. Introduction

Current Account and Capital Account are components of Balance of Payment. Current Account includes all the transactions involving exchange of economic value which concerned with foreign trade. It includes all flows of goods, services and transfers. Current account is broadly divided into two parts. First is Balance of Trade (BOT) which deals only with exports and imports of merchandise or visible items. Second is Balance of Invisibles (BOI) that records net receipts on invisible items like dividends, interests, royalties, travels, insurance, banking, transportations and unilateral transfers. Current Account as an important component of Balance of Payment highlights a country's foreign transactions of a period of time. It is the sum total of Balance of Trade (i.e. net revenue from exports minus payments for imports), factor income (earnings on foreign investments minus payments made to foreign investors) and cash transfers. As a measure of nature of country's foreign trade, Current Account equals to the change in net foreign assets. Positive sales abroad (exports greater than imports) contribute towards current account surplus. This surplus is possible only when an economy is consuming and spending less than what it is producing. The resulting savings are then invested abroad and thus, foreign assets are being created. If an economy is running into current account deficit, it means that domestic consumption, spending and investments are more than what it is actually producing. This will lead to rising foreign liabilities and decline in foreign asset. Large and persistent current account deficits constitute a cause for concern, particularly when sustainability issues are raised and thus the economic prospects of a country are put at risk. In the case of small open economies that heavily rely on external financing, an adverse change in foreign investors' behaviour may trigger a process of sharp and disorderly adjustment of external imbalances with serious consequences for the economy. This is highly relevant in the recent global financial and economic crisis, which seems to have exacerbated these risks, partly on account of the fact that the correction of the current account imbalances in the aftermath of the crisis was considered to be mostly cyclical and short-lived.

Exchange rate fluctuation or stability is the major concern which determines the quantum and direction of foreign trade and commerce^[1]. Exchange rate (XR) fluctuation and its effect on the volume of international trade is an important subject for empirical investigation, after the adoption of floating exchange rate 1973. Exchange rate fluctuation is defined as the risk associated with unpredicted movements in exchange rate. Macroeconomic variables such as interest rate, inflation rate, the balance of payments, tax rate etc influence the XR randomly. These macroeconomic variables are unstable and volatile depending on the state of the

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economy prevailing in their countries [2]. In addition increased cross border currency flows due to foreign direct investment and service like banking, insurance, education, tourism cause the exchange rate fluctuate randomly. Advent of on line trading, currency speculation is rampant and cause exchange rates to fluctuate. The balance of payments (BOP) is a net indicator of outflow and inflow of foreign currencies. Outflows and inflows are caused by international trade and services [3].

2. Review of Literature

Mukherjee and Naka (1995) [7] applied Johansen's (1998) VECM to analyze the relationship between the Japanese Stock Market and exchange rate, inflation rate, money supply, real economic activity, long-term government bond rate, and call money rate. They explored that a co integrating relation indeed existed and that stock prices contributed to this relation.

Mookerjee and Yu (1997) examined the nexus between Singapore stock returns and four macroeconomic variables such as narrow money supply, broad money supply, exchange rates and foreign exchange reserves using monthly data from October 1984 to April 1993. Their analysis revealed that both narrow and broad money supply and foreign exchange reserves exhibited a long run relationship with stock prices whereas exchange rates did not.

Ray (1993) attempt to unravel the relationship between the real economic variables and the capital market in Indian context by using modern non-linear technique like VAR and Artificial Neural Network researcher finds out that certain variables like the interest rate, output, money supply, inflation rate and the exchange rate has considerable influence in the stock market movement in the considered period, while the other variables have very negligible impacts on the stock market.

Dutta and Ahmed (2006), using co-integration and error correction model approaches investigated the behavior of Indian aggregated import demand during the period 1971-1995. The results obtained indicated that import volume is co-integrated with relative import price and real GDP. The output of the import demand in India is largely explained by real GDP and generally less sensitive to import price changes.

2.1 Objective

The main objective of the study is to find out the impact of external debt and exchange rate on current account deficit.

2.2 Research Methodology

An attempt has been made through the present study to explain the causes and effects of external debt and exchange rate on current account deficit. The present study is purely based on secondary data covering 15 financial years from 2000-01 to 2014-15. The requisite data related to external debt, exchange rate and current account deficit have been collected from various sources i.e. Hand Book of Statistics and Bulletin of Reserve Bank of India.

2.3 Statistical Tools & Techniques

In order to analyze the collected data, the statistical tools such as Karl Pearson's coefficient of Correlation and Multiple Regression is used. Correlation coefficient is a statistical measure that determines the degree to which the movements of variables are associated. In the present study, the linear relationship between Independent Variables external debt and exchange rate and dependent variable current account deficit is established. The multiple regression analysis is a technique used to evaluate the effects of two or more independent variables on a single dependent variable. Here, an attempt is made to study the impact of Independent Variables- external debt and exchange rate on dependent variable current account deficit.

3. Result and Discussion

Table 1 presents descriptive statistics for the variables used in our estimate. The dependent variable which is current account deficit shows the low of (-4796) and high of 640 during the last 15 years. Mean value of dependent variable is 1203.08 and standard deviation is 1532.38 which show the high fluctuation in this variable. The average of exchange rate is 48.3573 while the minimum is 40.26 and the maximum 61.14 which was observed during last 15 years. Mean value shows the value of 236154.13 and the standard deviation of 135676.65 which suggest that there is moderate variability in external debt.

Table 1: Descriptive Statistics

	N	Mean	S.D	Minimum	Maximum
CAD	15	-1203.08	1532.38	-4769	640
Exchange Rate		48.3573	5.849	40.26	61.41
External Debt	15	236154.13	135676.65	98263	475813

Source: Researcher Calculations

Table 2: Coefficients of Correlation

	CAD	Exchange Rate	External Debt
CAD	1.000	-.428	-.806
Exchange Rate	-.428	1.000	.746
External Debt	-.806	.746	1.000

Source: Researcher Calculations

Table 2 shows correlation of current account deficit with exchange rate and external debt. Exchange rate is (-.428) showing that exchange rate has moderate negative correlation with current account deficit. External debt correlation of (-.806) has a high degree negative correlation with current account deficit.

Table3 explain that R2 is a statistics that will give some information about the goodness of fit of a model. In regression, the R2 coefficient of determination is a statistical measure of how well the regression line estimates the real data points. In model 1 current account deficit coefficient of correlation is .428. It shows moderate positive correlation between exchange rate and current account deficit. R2 indicate that 18% current account deficit has relation with exchange rate. The impact of exchange rate on current account deficit is non-significant. In model 2 R is 0.848 which shows high positive correlation between current account deficit and external debt. External debt has 53% impact on current account deficit.

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.428 ^a	.183	.120	1437.548	.183	2.908	1	13	.112	
2	.848 ^b	.719	.672	878.132	.536	22.839	1	12	.000	1.542

a. Predictors: (Constant), EXCHANGERATE
 b. Predictors: (Constant), EXCHANGERATE, EXTERNALDEBT
 c. Dependent Variable: CAD

Table 4: ANOVA's

Model		Sum of square	DF	Mean square	F	Sig.
1.	Regression	6009906.147	1	6009906.147	2.908	.112
	Residual	26865058.69	13	2066542.976		
	Total	32874964.84	14			
2.	Regression	23621583.68	2	11810791.84	15.317	.000
	Residual	9253381.162	12	771115.097		
	Total	32874964.84	14			

a. Dependent Variable: CAD
 b. Predictors: (constant), Exchange Rate
 c. Predictors: (constant), Exchange Rate, External Debt

Table 4 presents the ANOVAs analysis; In case of current account deficit the F-Ratio for model 1 and model 2 are 2.908 and 15.317 respectively which are significant but the

F-Ratio for model 2 is more than other model. So, we can safely conclude that the model 2 is more significant in predicting the outcome variable.

Table 5: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1.	Constant	4213.746	3197.998		1.318	.210
	Exchange Rate	-112.017	65.686	-.428	-1.705	.112
2.	Constant	-3243.380	2500.198		-1.297	.219
	Exchange Rate	102.818	60.256	.392	1.706	.114
	External Debt	-.012	.003	-1.099	-4.779	.000

a. Dependent Variable: CAD

The analytical table 5 exhibits the estimates of b values (Unstandardized Coefficients) which explicate the individual contribution of each independent variable to the model. The positive value depicts positive relationships between the predictors and the outcome variables and vice-versa. The b-value also explains to what degree each predictor affects the outcome variable if the effects of other predictors are held constant. If we replace the b values in equation, we can define model as follows:

Model: $CAD = b_0 + b_1 \text{ Exchange Rate} + b_2 \text{ External Debt}$
 $= -3243.380 + 102.818 \text{ Exchange Rates} - .012 \text{ External Debt}$
 The standardized beta values exposed through the table indicate the volume of change in standard deviation dependent variable due to one standard deviation change in the independent variable. These values observe that as exchange rate increase by one standard deviation (5.849), current account deficit increases by 0.392 standard deviation. The standard deviation for current account deficit is 1532.38 and so, this constitute a change of 600.69296 (1532.38 * .392).

3.1 External Debt: (B= -1.099): These values observe that as external debt increases by one standard deviation (135676.65), current account deficit decreases by -1.099 standard deviation. The standard deviation for current account deficit is 1532.38 and so, this constitute a change of -1684.08562 (1532.38 * -1.099).

4. Conclusion

The study which was conducted to assess the impact of external debt and exchange rate on current account deficit found that external debt is the most important predictor of

current account deficit with R square values of .719 and coefficient of correlation .848. It was further indicated through the results that if two selected independent factors remains constant, then there are other factors which are explaining current account deficit up to 3243.382 units.

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