Current Account Imbalance and Exchange Rate Adjustment a Study of India

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Abstract

This paper is an attempt to analysis the role of permanent and temporary shocks to current account balance (CAB) and real effective exchange rate (REER) for the purpose of determining the proportion of Indian current account deficit (CAD) that can be corrected with a REER adjustment by using the SVAR model, to test the Quarterly data over a period of 1 April 2000 to June 2013. The study reveals that permanent shocks (PS) play a larger role in the explanation of the Indian CAB whereas temporary shocks (TS) have a larger role in explaining the variation in the REER. Variance decomposition results indicate that only a negligible portion of the CAD could be corrected through REER depreciation.

Keywords: Current Account Balance, Real Effective Exchange Rate, Permanent and Temporary Shocks, SVAR etc.

1. Introduction

The current account is an important signal of competitiveness and the level of imports and exports. CAD occurs when a country's government, businesses and individuals imports more goods, services—such as banking and insurance and capital than it exports (The report of Bureau of Economic Analysis). A large CAD usually implies some kind of imbalance in the economy, which needs correcting with depreciation in the exchange rate and / or improved competitiveness over time. REER is a multilateral exchange rate index. It is compiled as a weighted average of exchange rates of home versus foreign currencies, with the weight for each foreign country equal to its share in trade.

2. Overview of Previous Studies

Chandar Henry and Rohan Longmore (March 2003),**Tamalia Franklin** (August 2010), **Ankit Jaini** (February 2013) thoroughly studied the Relationship between CAB and REER, concluded that REER does not play a significant role in determining the major proportion of the current account whereas **Jaewoo Leea Menzie D. Chinnb** (2004), Current Account and Real Exchange Rate dynamics in the G-7 Countries, and **Michael G Arghyrou and Georgios Chortareas** (April 2006), Real exchange rates and current account imbalances in the Euro-area and find that a positive relationship exists between the movements of REER and CAB in the majority of selected countries.

The India's Current Account Balance & Real Effective Exchange Rate Index

The figure 1 shows that CAD has been widening, especially during the last 8 years of selected period, the deficit on the current account grew with 3.9 % of GDP from 2004 to 2012. The figure 1 also depicts the path of India's REER since 2000-01, which was not always consistent with the trends in the current account. In terms of the relationship between the CAD and REER index of India, figure 1 indicate that there are periods where the two variables have run counter to theoretical predictions. For example, decrease in the REER from April 2000 to June 2013 coincided with increasing deficit on the current account.
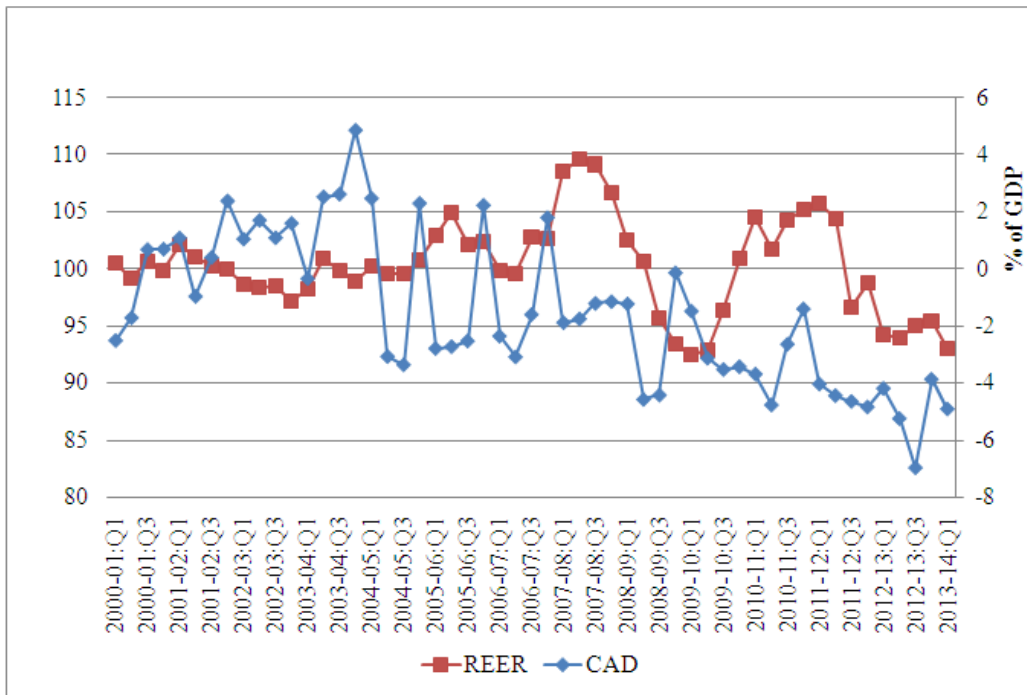
Source: Own calculation based on RBI database.

Figure 1: CAD and REER in INDIA.

3. Emparical Results - Unit Root Test

The unit root test is based on the t-statistics on the coefficient of the lagged dependent variable.

Table 1: Null Hypothesis: CAD and REER has a unit root.

Unit Root Test Results (with intercept)					Unit Root Test (with intercept and time trend)			
VARIABLE	ADF(level)	P value	ADF(first difference)	P value	ADF(level)	P value	ADF(first difference)	P value
CAD	-.184553[0]	0.001***	-8.002044[2]	0.00***	-5.131873[1]	0.0006***	-.064330[2]	0.00***
REER	-.343482[2]	0.0180**	-6.141607[0]	0.00***	-3.387504[2]	0.0646*	-.156294[0]	0.00***

1) The *, **, and *** indicate rejection the null hypothesis at 10%, 5%, and 1% significant levels
2) The lag length of the ADF regression is specified in brackets [ ].

Tables 1 report the results of Stationarity, which suggest the rejection of unit root null hypothesis for both variables (CAD and REER) at the level (except for REER when time trend was added to the regression model) at 5% level of significance. However, all variables were found stationary at their first differences.

Table 2: Correlation Matrix.

VARIABLES	CAD	REER	91 -day T-Bill rate	GDP
CAD	1			
REER	-0.06653	1		
91 -day T-Bill rate	-0.46334	0.439679	1	
GDP	0.575495	-0.17305	-0.786382328	1

The result shows that the T-Bill Rate (temporary shocks) has a negative and moderate correlation with CAD and positive to REER with a correlation coefficient of -0.46334 and 0.439679, suggests that a positive shock to the interest rate will result in an opposite movement in the CAD and increasing the rate of exchange. On the other hand GDP (permanent shocks) has a moderate positive correlation with CAD and negatively lower correlation with REER, suggest that as GDP has persistently decreased over the years under review, the current account deficit has steadily increased and REER has decreased. On the basis of correlation researcher have concluded the significant and positive correlation between (CAD and GDP) and

(REER and T-Bill Rate) so the relationship between REER and 91-day T-bill rate and the CA and GDP was observed to test the presence of a long-run relationship between the variables by using cointegration test.

Cointegration Test -It is used to know the stationary of a linear combination of two or more time series despite being individually nonstationary.

Unrestricted Cointegration Rank Test

Table 3 a: Johnson Cointegration test- REER and T-Bill Rate.

Trace					Maximum Eigenvalue			
Hypothesized No. of CE(s)	**Eigen value**	**Trace Statistic**	**Critical Val. (5%)**	**Prob.**	**Eigen value**	**Maximum Eigenvalue**	**Critical Val. (5%)**	**Prob.**
None	0.156153	27.951087	15.49471	0.0007	0.156153	27.470510	14.26460	0.0051
At most 1	0.010863	0.480577	3.841466	0.4882	0.010863	0.480577	3.841466	0.4882

Table 3 b: Johnson Cointegration test- CAD and GDP.

Trace					Maximum Eigenvalue			
Hypothesized No. of CE(s)	**Eigen value**	**Trace Statistic**	**Critical Val. (5%)**	**Prob.**	**Eigen value**	**Maximum Eigenvalue**	**Critical Val. (5%)**	**Prob.**
None	0.408167	26.75174	15.49471	0.0007	0.408167	26.75111	14.26460	0.0003
At most 1	1.24E-05	0.000632	3.841466	0.9814	1.24E-05	0.000632	3.841466	0.9814

* denotes rejection of the hypothesis at 0.05 level

Tables 3a; 3b, show the Results from the Trace and Max-eigenvalue tests indicate that the REER and the T-bill rate are related in the long-run implying that the REER has been largely driven by temporary shocks while the current account has been largely driven by permanent shocks. The evidence purported by the above tests lead us to assert that the REER and current account have been largely driven by temporary and permanent shocks.

3.1 Structural Vector Autoregressions

Structural Vector Autoregressions (SVARs) are a multivariate, linear representation of a vector of observables on its own lags. SVARs are used by economists to recover economic shocks from observables by imposing a minimum of assumptions

compatible with a large class of models. It is calculated by imposing the long run or short run restrictions.

3.2 The short run restriction is identified by enter the following equation in the text box.

$$@e1 = C(1)*@u1 \quad \text{Where- } @e1 \qquad \text{represents CAD residuals}$$
$$@e2 = C(2)*@e1 + C(3)*@u2 \qquad @e2 \text{ represents REER residuals}$$

3.3 Similarly to impose the long run restrictions in the text form the following equation is used

$$@LR2(@u1) = 0$$

Impulse Response Function- It is conducted to determine the forecast direction that the REER and the current account will take in reaction to a positive shock by imposing the long run restriction.
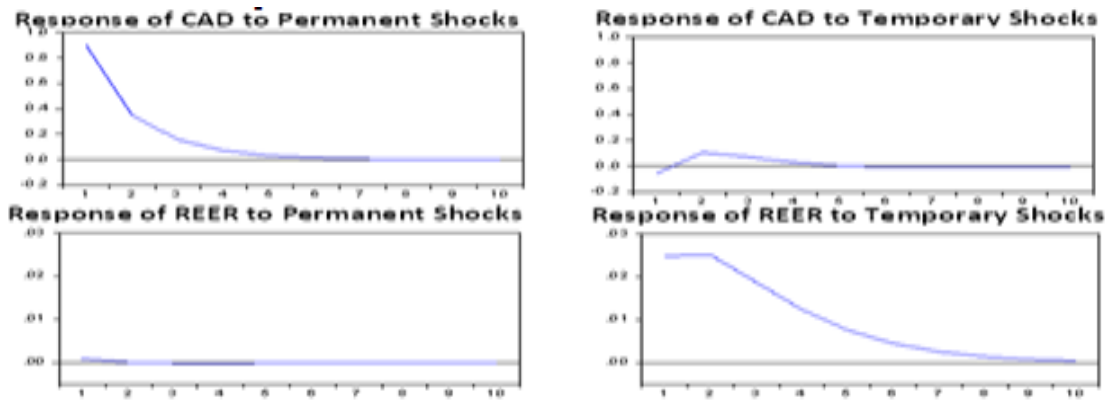

Figure 2: Response to structural one S.D. Innovation.

Figure 2, shows that under PS to the CAD, the current account surplus is gradually decline until the equilibrium in the seventh quarter whereas the impact of a TS induced an increase in CA surplus for two periods then gradually leads to equilibrium in the fifth quarter. In case of PS the response of REER is negligible whereas under TS, exchange rate is less appreciated for the first two quarters then began to depreciate until returning to equilibrium in the last.

3.4 Variance Decomposition

Table 2 below shows that PS account for 98% (average) of the forecast error variation in the CA, suggesting that the temporary component accounts for the remaining 2% only. Most of the forecast error variation in the REER is largely explained by its own shocks (TS) accounting for approximately 99.9 per cent in the long-run. These results suggest that only approximately a 2.0 per cent correction of the current account imbalance may be obtained from a real depreciation in the REER in the long-run.

	CAD			REER		
Period	S.E.	Permanent Shock	Temporary Shock	S.E.	Permanent Shock	Temporary Shock
1	0.900898	99.61477	0.385234	0.024807	0.108147	99.89185
2	0.972135	98.46804	1.531960	0.035286	0.053583	99.94642
3	0.987407	97.99107	2.008934	0.039963	0.043622	99.95638
4	0.990285	97.91759	2.082415	0.041833	0.042162	99.95784
5	0.990776	97.91848	2.081521	0.042517	0.042369	99.95763
6	0.990899	97.91369	2.086309	0.042748	0.042693	99.95731
7	0.990965	97.90471	2.095289	0.042822	0.042883	99.95712
8	0.991004	97.89779	2.102214	0.042845	0.042968	99.95703
9	0.991025	97.89395	2.106052	0.042851	0.043002	99.95700
10	0.991034	97.89218	2.107821	0.042853	0.043014	99.95699

4. Conclusion

The Indian current account has exhibited persistent deficits, which indicates the need for structural changes in the economy. Variance decompositions indicated that TS played a larger role in explaining the variation in the REER, while the CA was largely driven by PS. Over the past decade, the real sector in the Indian economy has not been able to facilitate the necessary adjustment that should take place from the REER to the CA. It has also been proven econometrically that the relatively small significance of the temporary component in the CA, suggests that a significant adjustment of the CA would not occur through a REER adjustment. We therefore conclude that this adjustment in the current account imbalance may not be entirely achieved through the manipulation of monetary variables such as interest rates but rather through enhancing the macroeconomic environment to increase productivity.

References

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