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1

#### STUDY OF CASUALTY IN THE STRUCTURE OF INDIA'S BALANCE OF PAYMENT

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Abstract:-The present paper intends to analyze the short run and long run causality between current account and capital account in a very comprehensive manner. We have conducted Wald test, Granger casualty test, Vector error correction model and Johansen co integration test to find out long run and short run causality and its direction between current account and capital account. Our empirical analysis is based on annual data on current account balance and gross foreign capital inflows, for the period 1990-2012. The direction of causality will help us to find out the policy framework to improve and manage India's Balance of payment position. There is short run bidirectional causality between capital account and current account. Granger causality and vector error correction model suggest that in the long run current account encourages and causes capital account. These papers suggest policy to manage balance of payment should focus on managing current account via domestic expenditure.

Keywords: Casualty, Current account, Capital Account, Johansen co integration test, Wald test, Granger Casualty, Vector Error Correction Model, Unit Root Test

#### **INTRODUCTION**

The movement of capital account and current account in the past has always seen an inverse relationship in practice in India. This pattern has been observed both across the nation at a point of time and within a country during different time intervals. In the past, it has been observed, that balance of payment position does not improve, even if current account deficit decline. Similarly there had been a growing strength in India's balance of payment position in the post reform period in spite of growing trade deficit and current account deficit. Clearly, a decline in Current account deficit alone is not going to shore up the Balance of payment; attracting inflows through the capital and financial account is equally important to improve Balance of payment.

This observation has been clearly substantiated by recent changes in three variables that is current account deficit, capital account and balance of payment account The current account deficit rises to US dollar 5.2 billion (1.2 % of GDP) in second quarter of financial year 2014 from US dollar 21.8 billion (4.9% of GDP. The key reason for improvement was higher exports and moderation in imports, particularly of gold Imports.Net inflow under the capital and financial account declined by US Dollar 5.3bn in second quarter of financial year 2014 compared with an addition of US dollar 20.5 bn during first quarter. Despite a net inflow under the foreign direct investment (FDI), external commercial borrowing and banking capital heads, capital and financial account witnessed a net outflow owing to net huge outflow under the head of portfolio investment and other capital. Despite lower Current account defict, there was a drawdown of forex reserve. In order to monitor the position of balance of payment, we need to consider both current account and capital account. But at the same time, current account and capital account leads to changes in current account or the relationship is bidirectional. In the case that current account imbalances encourage foreign capital inflows, concerns regarding the external balance of the economy should be dealt with policies focusing on managing domestic expenditure. On the other hand, if foreign capital inflows are the cause of current account deficits, then sustainability concerns regarding external debt should be dealt with policies focusing in managing capital inflows (Anastasios, 2012).

## Bunny Singh Bhatia and Brijesh Yadav, "STUDY OF CASUALTY IN THE STRUCTURE OF INDIA'S BALANCE OF PAYMENT" Indian Streams Research Journal | Volume 4 | Issue 1 | Feb 2014 | Online & Print

#### SIGNIFICANCE OF THE STUDY

Both Current account deficit and foreign capital flow are part of a countries 'balance of payment'. There are basically three kind of possible relationship between current account deficit and foreign capital. Firstly current account deficit could cause foreign capital because deficit means more funds requirement. Secondly, foreign capital could leads to widening current account deficit due to rise in the exchange rate of a country. Thirdly, there may BE A bidirectional relationship between the two variables, which may arise out of various factors. The importance of studying these relationships is that there is a policy implication for a country. If Current account deficit causes foreign capital inflow, then there is a need for check on domestic expenditure to monitor external imbalances. On the other Hand, If Current account deficit is induced by the capital inflow, there is a need for managing capital inflow to correct bop position.

#### LITERATURE REVIEW

Forogue and Veloce (1990) find out bidirectional causality between financial and current accounts for the case of Canada. Fry et al. (1995) examine developing economies finds no major tendencies on the causality between foreign direct investment and current account deficits. Bosworth and Collins (1999) examine 58 developing countries to found that current account deficits force foreign capital flows. Chinn and Prasad (2000) -examining eighty nine developed and developing countries for the period 1971-1995- find that "financial deepening does have a significant and robustly positive effect on the current account in developing countries but not in industrial countries". Sarisoy-Guerin (2003), Yan (2005), and Yan and Yang (2007) find that while for industrial countries current account changes induce foreign capital inflows, the direction of causality is reversed for developing countries. Ersoy (2011) -examining the Turkish economy- finds a unidirectional relationship running from financial inflows to current account deficits. Similarly, Mastroyiannis (2011) - examining the Greek economyfinds that capital inflows induce current account changes Jayati Ghosh (1990), find out that exchange rate instrument alone as a means of improving current deficits is unlikely to prove successful. Clearly attempts to influence the relative price ratio must form an important part of any attempt to adjust the balance of payments. Prabirjit Sarkar (1992) also casts some doubt on the effectiveness of the current policy of devaluation and depreciation in solving India's trade and payment deficits.. Prabirjit Sarkar (1994) suggests out that there is no fundamental force inherent in the system that creates the problem of balance of trade and payments deficit in India. R Kannan (1989) in his study explained, the demand for and the supply of money play a fundamental role in its determination of balance of payment. Meenakshi Rishi and James K Boyce (1990) explained about an examination of available data for the period 1971 to 1986 indicates that India's official balance-of- payments accounts do not record a number of hidden foreign exchange flows between India and the world economy. Alok Ray (1987) study is contrary to previous studies as the author prefers devaluation as policy to improve Balance of goods traded. Robert Flood (1977) that price movements, exchange rate adjustments, and the balance of payments are the accommodating results of changes in real and monetary factors in an economy. Akira Uegaki (2009) find out that in India, the Saving-Investment balance slightly exceeded the fiscal deficit in the first Four years, but more recently, it is insufficient to cover the fiscal deficit and the shortage is being covered by foreign capital. India is now showing the features of a typical capital-shortage developing industrial country, in which investment is actively conducted and fiscal spending is growing to cover social needs in a rapidly changing society

#### **RELATION TO THE PRESENT STUDY**

The literature review has provides us two related aspect. One aspect is of causality of capital account and current account and other aspect is related with factors that causes adjustment to the balance of payment position. In present study, we will be looking in depth the casualty aspect of India's balance of payment and try to give answer to the second aspect of adjustment of balance of payment.

#### **DATAAND METHODOLOGY**

Our empirical analysis is based on annual data on current account balance and gross foreign capital inflows, for the period 1990-2012. The time period chosen is 1990-2012 in order to make financial liberalization into account. Current account balance (CA) is the sum of the trade balance on goods and services, net income from abroad and net current transfers. The source of our data on current account balance and foreign capital is the RBI. Our data on gross foreign capital inflows (FC) consist of the sum of the foreign investment, External assistance, commercial borrowing and other capital. We have conducted wald test, granger causility test, vector error correction model and Johansen co integration test to find out long run and short run causality and its direction between current account and capital account. Moreover in order to check stationarity, we conducted unit root test.

2



Figure 1: Current account and Capital account balance for 1950-2012

The evolution of current account balance and foreign capital inflows is presented in Figure 1.Upto 1978 and 1979; the current account balance is oscillating around zero. After 1980, the current account position exhibits a persistent growing negative trend.

#### **Descriptive statistics**

As is indicated in Table 1, the average current account position for the period 1950-1990 equals to -1384 US million dollars, while after 1990 the averaged current account deficit rise to -14811.3. Similarly, the pattern of foreign capital inflows during 1980-1996 is different compared with their pattern after 1996. Foreign capital averaged to 1379 US million dollars before 1990. After 1990, foreign capital inflows exhibit a , averaging to 26461 US million Dollars. The inverse relationship between current account and foreign capital inflows presented in Figure 1 is validated by the negative correlation (-.76) between the two variables.

	Current Account	Capital Flow
1950-1990		-
Mean	-1384.68	1379.625
Median	-686	719
Standard deviation	2059.504	1934.164
1990-2013		
Mean	-14811.3	26461.78
Median	-4698	10640
Standard deviation	25519.33	29812.55
	Correlation	
		-0.7588

Furthermore, visual inspection of Figure 2 further validates negative correlation between the variables expressed as a percentage of GDP.

3



Figure 2: Current account to GDP ratio (%) and Capital account balance to GDP ratio (%) for 1980-2010

#### **EMPIRICAL INVESTIGATION**

With regard to the statistical properties of the data, our findings suggest that current account and capital account are non-stationary time series. We examine the order integration using the Augmented Dickey Fuller (ADF) test . The results are not presented due to lack of space. The ADF tests examine the validity of the null hypothesis that a variable is a realization of a stochastic series containing a unit root. The ADF tests could not reject the null hypothesis that capital and Current account are non-stationary at their levels. In contrast, the null hypothesis of non-stationary is rejected at 10 % level of significance for the first difference of both variables.

In Order to see that whether capital account and current account have some long run association or not, we conducted Johansen co integration test. It is clear from table 2 in the appendix that hypothesis that there is none co integrating equation is rejected and at most one co integration is accepted which means that At lag 3, the both trace test and maximum eigen value result suggest one co integrating equation between the two variables meaning that the two variables move together and have long run association

There is a negative relationship between the two variables as suggested by normalized co integrated in table 3 in appendix coefficient of -0.33. It suggests that 33% of both data are inversely related.

Next, we conducted Granger casualty test on stationary data of capital account and current account at 5 % level. Capital account is stationary at second difference and current account is stationary at first difference. The result of granger causality is given in table 4 Granger casualty results suggest that current account causes capital account but not vice versa in table 4. The result is significant at lag3, lag4, and lag 5. The result given by granger causality needed to be affirm by vector error correction model

#### Causality from capital account to current account

Next we conducted vector error correction model to check the long run causality between capital account and current account. The result of long run causality from capital account to current account is given in table 5 which gives C(1) coefficient of 0.11 which is significant. The non negative coefficient suggests that there is no long run casualty from capital account to current account. From coefficient of C(5), C(6), and C(7) we conducted wald test to find out short run causilty from capital account to current account in table 6. P value of chi square of 0.0301 suggest rejection of null hypothesis that C(5), C(6), and C(7) are equal to zero. It means that there is short run causality from capital account to current account There is no arch effect and serial correlation in the model which is quite good.

#### Causality from current account to capital account

The result of long run causality from current account to capital account is given in table 7 which gives C(1) coefficient of - 0.99 which is significant. The negative coefficient suggests that there is long run casualty from current account to capital account. From coefficient of C(5), C(6), and C(7) we conducted Wald test to find out short run causality from capital account to current account in table 6. P value of chi square of 0.01 suggest rejection of null hypothesis that C(5), C(6), and C(7) are equal to zero. It means that there is short run causality from capital account to current account There is no arch effect and but some instances of serial correlation in the model

4

#### **CONCLUSION AND RECOMMENDATION**

Johansen co integration test finds out that that the two variables move inverse and have long run negative association. In short run, Wald test confirm short run bidirectional casualty between capital account and current account. Granger casualty results suggest that current account causes capital account but not vice versa at lag3, 4 and 5. Vector error correction model confirms that there is a long run casualty from current account to capital but not vice versa. This means that a home grown phenomenon is more important than external factors. Therefore there is a need for looking into maintaining current account via domestic expenditures control. India is in the stage of capital needing country, but we should try improve saving and reduce fiscal deficit and expenditure to manage high flow of foreign capital and thereby balance of payment account

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5

#### Appendix

#### Table 2 Johansen co integration test

1. Unrestricted C	ointegration Rank Test	(Trace)		
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.674895	21.23972	15.49471 3.841466	0.0061 0.3138
At most 1 Trace test indicates 1 c * denotes rejection of t **MacKinnon-Haug-M	0.054818 ointegrating eqn(s) at the he hypothesis at the 0.03 fichelis (1999) p-values	e 0.05 level 5 level		
At most 1 Trace test indicates 1 cc * denotes rejection of tl **MacKinnon-Haug-M 2. Unrestricted C	0.054818 ointegrating eqn(s) at th he hypothesis at the 0.02 fichelis (1999) p-values ointegration Rank Test (	e 0.05 level 5 level	;)	
At most 1 Trace test indicates 1 cc * denotes rejection of tl **MacKinnon-Haug-M 2. Unrestricted C Hypothesized No. of CE(s)	0.054818 ointegrating eqn(s) at the he hypothesis at the 0.03 fichelis (1999) p-values ointegration Rank Test ( Eigenvalue	(Maximum Eigenvalue Max-Eigen Statistic	e) 0.05 Critical Value	Prob.**
At most 1 At most 1 Trace test indicates 1 cc * denotes rejection of tl **MacKinnon-Haug-M 2. Unrestricted C Hypothesized No. of CE(s)	0.054818 ointegrating eqn(s) at the he hypothesis at the 0.03 fichelis (1999) p-values ointegration Rank Test ( Eigenvalue 0.674895	Maximum Eigenvalue Max-Eigen Statistic	0.05 Critical Value	Prob.** 0.0051

#### Table: 3 Normalized co integrating coefficients

1 Cointegrating Equation	n(s):	Log likelihood	-376.5724	
Normalized cointegratin	g coefficients (standard	error in parentheses)		
CAP	CA			
1.000000	-0.339488			
	(0.36869)			

6

Pairwise Granger Causality Tests Date: 01/04/14 Time: 00:49 Sample: 1991 2012 Lags: 3			
Null Hypothesis:	Obs	F-Statistic	Prob.
DDCA does not Granger Cause DCAP DCAP does not Granger Cause DDCA	17	8.76565 1.26248	0.0038 0.3392
Lags: 4			
Null Hypothesis:	Obs	F-Statistic	Prob.
DDCA does not Granger Cause DCAP DCAP does not Granger Cause DDCA	16	10.0099 1.62768	0.0051 0.2690
Lags: 5			
Null Hypothesis:	Obs	F-Statistic	Prob.
DDCA does not Granger Cause DCAP DCAP does not Granger Cause DDCA	15	7.74353 5.48215	0.0348 0.0621

7

#### Table4: Granger casualty test

 Table 5 Long run causality from capital account to current account tested by Vector error correction model

Dependent Variable: D(CA)				
Method: Least Squares				
Date: 01/04/14 Time: 02:35				
Sample (adjusted): 1995 2012				
Included observations: 18 after adjust	ments			
D(CA) = C(1)*( CA(-1) - 2.945609569	72*CAP(-1) + 93847.0	)836347) + C(2)		
*D(CA(-1)) + C(3)*D(CA(-2)) + C	(4)*D(CA(-3)) + C(5)*I	D(CAP(-1)) + C(6)		
*D(CAP(-2)) + C(7)*D(CAP(-3)) -	+ C(8)			
	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.119991	0.047520	2.525079	0.0301
C(2)	-0.098243	0.298556	-0.329060	0.7489
C(3)	-0.200600	0.343214	-0.584475	0.5719
C(4)	-0.215170	0.371041	-0.579909	0.5748
C(5)	0.254570	0.132595	1.919898	0.0838
C(6)	0.189378	0.118346	1.600208	0.1406
C(7)	0.210861	0.083295	2.531490	0.0298
C(8)	-8028.763	2935.164	-2.735372	0.0210
R-squared	0.689946	Mean dependent var		-4710.778
Adjusted R-squared	0.472909	S.D. dependent var		9223.985
S.E. of regression	6696.709	Akaike info criterion		20.75772
Sum squared resid	4.48E+08	Schwarz criterion		21.15344
Log likelihood	-178.8195	Hannan-Quinn criter.		20.81229
F-statistic	3.178927	Durbin-Watson stat		2.168588
Prob(F-statistic)	0.048075			

8

Wald Test: Equation: Untitled			
Test Statistic	Value	df	Probability
F-statistic Chi-square	2.979249 8.937746	(3, 10) 3	0.0830 0.0301
Null Hypothesis Summary:			
Normalized Restriction (= 0)		Value	Std. Err.
C(5) C(6) C(7)		0.254570 0.189378 0.210861	0.132595 0.118346 0.083295
Restrictions are linear in coefficients.			

Table 6 short term causality from capital account to current account tested by wald test

Table 7 Long run causality from current account to capital account tested by Vector error correction model

Dependent Variable: D(CAP)				
Method: Least Squares				
Date: 01/04/14 Time: 02:47				
Sample (adjusted): 1995 2012				
Included observations: 18 after adjustme	ents			
D(CAP) = C(1)*( CAP(-1) - 0.339488304	1995*CA(-1) - 31859.9	9873519)+		
C(2)*D(CAP(-1)) + C(3)*D(CAP(-2)	) + C(4)*D(CAP(-3)) -	+ C(5)*D(CA(-1))		
+ C(6)*D(CA(-2)) + C(7)*D(CA(-3))	+ C(8)			
	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.996556	0.451154	-2.208905	0.0517
C(2)	-0.190716	0.427369	-0.446256	0.6649
C(3)	-0.035364	0.381440	-0.092711	0.9280
C(4)	0.097046	0.268469	0.361479	0.7253
C(5)	-1.081563	0.962278	-1.123961	0.2873
C(6)	-2.304648	1.106215	-2.083363	0.0638
C(7)	-2.886321	1.195902	-2.413509	0.0365
C(8)	-11213.25	9460.338	-1.185290	0.2633
R-squared	0.724410	Mean dependent var		4601.833
Adjusted R-squared	0.531497	S.D. dependent var		31534.05
S.E. of regression	21584.19	Akaike info criterion		23.09841
Sum squared resid	4.66E+09	Schwarz criterion		23.49413
Log likelihood	-199.8857	Hannan-Quinn criter.		23.15298

F-statistic	3.755116	Durbin-Watson stat	1.136529
Prob(F-statistic)	0.029278		

9

Wald Test:			
Equation: Untitled			
Fest Statistic	Value	df	Probability
-statistic	3.296220	(3, 10)	0.0662
	9 888661	3	0.0195
Null Hypothesis Summary:	0.000001		
Null Hypothesis Summary:		Value	Std. Err.
Null Hypothesis Summary: Normalized Restriction (= 0)		Value	Std. Err.
Null Hypothesis Summary: Normalized Restriction (= 0) C(5)		Value -1.081563	Std. Err. 0.962278
Null Hypothesis Summary: Normalized Restriction (= 0) C(5) C(6)		Value -1.081563 -2.304648	Std. Err. 0.962278 1.106215

Table 8 short term causality from current account to capital account tested by wald test



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10

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