

THE TWIN DEFICITS PROBLEM IN INDIA

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Abstract: *The main aim of this paper is to investigate the twin deficit problem for the Indian economy using Granger Causality Test for the period 1988-2017. The co-integration analysis shows that there is a long run relation between budget deficit and current account balance. Despite the high savings rates, the twin deficits are valid for the Indian economy. The direction of the relationship is budget deficit to current account balance according to Granger Causality Test results. This result is consistent with the traditional Keynesian twin deficit hypothesis.*

Keywords: *Budget Deficit, Current Account Balance, Twin Deficits, Granger Causality.*

1. INTRODUCTION

Twin deficit hypothesis suggests that there is a positive and strong causality relationship between the current account deficit and the budget deficit (Parkin, 2000, p.848). In other words, the budget deficit by the increase in government expenditures is called the twin deficit, which affects the balance of current accounts negatively. In the early 1980s, the United States faced a major budget deficit problem. This budget deficit has led to a decline in economic activity. In the following process, budget deficits were also accompanied by high deficits in the balance of current account. This situation initiated the "twin deficit" debate, which expresses the relationship between the two deficits, and the relationship between the two deficits has become an important issue of economic policies (Khalid and Guan, 1999: 389). The debt crisis that emerged in developed countries following the 2008 global financial crisis, which has deeply affected the world, has led to a re-questioning of the budget and current account deficit relationship in many countries. It is important to know the direction of budget and current account balance deficits relation in terms of finding a solution to the twin deficit problem.

The budget deficits lead to current account deficits, and these two deficits appear at the same time according to twin deficit hypothesis. In a sense, the twin deficit hypothesis represents the collective action of budget deficits and current account deficits.

Budget deficits and current account deficits, which are the main indicators of economic policies, are chronic problems in many developed and developing countries.

One of the most fundamental economic problems facing most developing countries is the current account deficit and the choice of policy to be implemented to address this deficit (Bayraktutan and Demirtaş, 2011). The changes in the current account are evaluated as a signal for the course of the economy and therefore play a decisive role in shaping economic decisions and expectations (Erdoğan and Bozkurt, 2009).

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The main aim of this paper is to test the twin deficit hypothesis by Granger Causality for Indian economy for the period 1988-2017. The remaining part of the paper is arranged as follows. In the first part, the theoretical structure of the relationship between budget deficits and current account deficits is given. In the second part, the literature review is given. In the third part, data set and empirical application are given. In the last part of the paper, the results are discussed.

2. THEORETICAL FRAMEWORK

The relationship between budget deficit and current account deficits is dealt with as the Traditional Keynesian Approach, the Ricardian Equivalence Approach, and the Neo-Classical Approach. While there is a positive relationship between budget deficit and current transactions in the Keynesian approach, there is no relation between budget deficit and current account deficit in the Ricardian Equivalence hypothesis. Monetarists argue that there is a positive relationship between budget deficits and current account deficits. The neo-classical approach defends the idea that long-term permanent budget deficits affect economic variables rather than temporary budget deficits.

Relations between budget deficits and current account deficits in open economies are shown to depend on national income equality. National income equality; (Krugman and Obstfeld, 2006: pp.285-291).

$$Y = C + I + G + (X - M) \quad (1)$$

$$Y - (C + I + G) = CAB \quad (2)$$

Y refers to national income, C refers to private consumption expenditure, G refers to government expenditure and also (C+I+G) represents total expenditure, X refers to export and M refers to import. Net exports (X-M) represent current account balance (CAB).

S represents savings in closed economy assumptions. Given that savings are equal to investments, S=I, it is obtained by subtracting national consumption expenditures from national income ($Y - C = S$).

In the open economy, (S), national saving is equal to the unconsumed part of the national income both of private consumption and government expenditure.

$$S = Y - C - G \quad (3)$$

$$I = Y - C - G \quad (4)$$

(S) National saving equation is:

$$S = I + CAB \quad (5)$$

Total savings is the sum of private sector savings (Sp) and government sector savings (Sg).

$$S = S_p + S_g \quad (6)$$

Private sector savings (Sp) refer to the part of the after-tax income that is not consumed.

$$S_p = Y - T - C \quad (7)$$

Government sector savings (S_g) show the difference between the net tax revenue generated by the government sector and government expenditures.

$$S_g = T - G \tag{8}$$

When the national saving function is regulated in the light of all these definitions,

$$S = Y - C - G = (Y - T - C) + (T - G) = S_p + S_g \tag{9}$$

For open economies,

$$S = I + CAB = S_p + S_g \tag{10}$$

$$S_p = I + CAB - S_g = I + CAB - (T - G) = I + CAB + (G - T) \tag{11}$$

$$CAB = S_p - I - (G - T) \tag{12}$$

$$CAB = (S_p - I) - (G - T) \tag{13}$$

CAB represents current account balance, $(S_p - I)$; it represents the difference between private savings and private investments.

If the gap between private investments and private savings is stable, any increase in budget deficits leads to an increase in current account deficits. This interaction leads to the twin deficit (Erdoğan, 2008).

3. LITERATURE REVIEW

The relationship between budget deficit and current account deficit has been addressed in many scientific studies. Studies in the economic literature related to the effects of budget deficits have shown different results for different periods in different countries by different researchers using different models and methods. But it cannot be said that a common consensus has been reached in these studies. The studies that test the relation between budget deficit and current account deficit are considered chronologically in table 1.

Table1: Literature Review

<i>Study</i>	<i>Sample</i>	<i>Period</i>	<i>Methodology</i>	<i>Main Finding</i>
Darrat (1988)	U.S.	1960-1984	Granger Casuality	Bidirectional relation
Haug (1990)	U.S.	1929-1985	Granger Casuality	No relation
Zietz and Pemberton (1990).	U.S	1972-1987	OLS Regression	BD to CAB
Bachman (1992)	U.S.	1974-1988	Bivariate VARs.	The U.S. must reduce the Federal budget deficit to eliminate its current account deficit.
Winner (1993)	Australia	1983-1989	Regression analysis	The Ricardian Equivalence Theorem supports the movements in the economy

Vamyoukas (1999)	Greece	1948-1994	Error Correction Model and Granger Causality	Unidirectional relation, budget deficit to trade deficit.
Akbostancı and Tunç (2002)	Turkey	1987-2001	Error Correction Model	There is a long-run relationship between the two deficits.
Kaufmann et.al (2002)	Austria	1976-1988	VAR	Budget deficits do not affect current account deficits.
Kouassi et.al. (2004)	Twenty developed and developing countries	1950-1988	Granger Causality	Unidirectional or bi-directional relation. for developed countries are less persuasive
Pattichis (2004)	Lebanon	1982-1987	Error Correction Model	Unidirectional relation, budget deficit to trade deficit.
Baharumshah et.al. (2006)	ASEAN	1976-2000	Granger Causality	Bidirectional relation
Kim and Kim (2006)	Korea	1970-2003	Modified Wald Test	CAB to BD.
Ganchev et.al (2012)	CEE countries	1998-2009	OLS Panel Regression	Twin deficit rejected in the case of Bulgaria and Estonia.
Kalou and Paleologou (2012)	Greece	1960-2007	VECM	CAB to BD
Perera and Liyanage (2012).	Sri Lanka	1960-2009	Granger Casualty	Unidirectional relation
Chihi and Normandin (2013)	Selected developing countries	From 1960 onwards	Generalized Methods of Moments	the positive and statistically significant covariance between fiscal deficit and current account deficit
Trachanas and Katrakilidis (2013).	Five European economies	1971-2009	The asymmetric co-integration methodology	direct long-run connection between the two deficits
Xie and Chen (2014)	Eleven OECD countries	1980-2010	Panel Granger Causality	No relation for UK and France. BD to CAB for Norway and Switzerland. The current account targeting hypothesis valid for Ireland, Spain and Sweden Bidirectional causality for Belgium, Finland, Greece and Iceland.
Ravinthirakumaran, et.al.(2016).	Five SAARC countries	1980-2012	Granger Causality	BD to CAB in Pakistan and Sri Lanka CAB to BD in India and Nepal Short run causality CAB to BD in Bangladesh.

Bhat and Sharma (2018)	India	1970-2016	Non-linear ARDL	therefore refutes the Ricardian Equivalence proposition and validates the twin-deficit hypothesis
Helmy (2018)	Egypt	1975-2014	VAR-VECM	CAB to BD in short-term according to VAR results, refutes the twin deficit hypothesis in favor of the current account targeting hypothesis according to VECM
Mohanty (2018)	India	1970-2014	ARDL	The results support the validity of twin deficits hypothesis.
Turan and Karakaş (2018).	CEE Countries	1996-2016	NARDL	CAB to BD in Poland and Romania in the long-run and Croatia, Poland, Romania and Slovakia in the short-run BD to CAB in Czech Republic, Hungary, and Slovakia in the long-run and in Czech Republic, Hungary, Slovakia, and Romania in the short-run.

The results of the studies can be summarized as follows:

- There is a unidirectional relationship between current account deficit and budget deficit,
- There is a bidirectional relationship between current account deficit and budget deficit,
- There is no relationship between current account deficit and budget deficit.

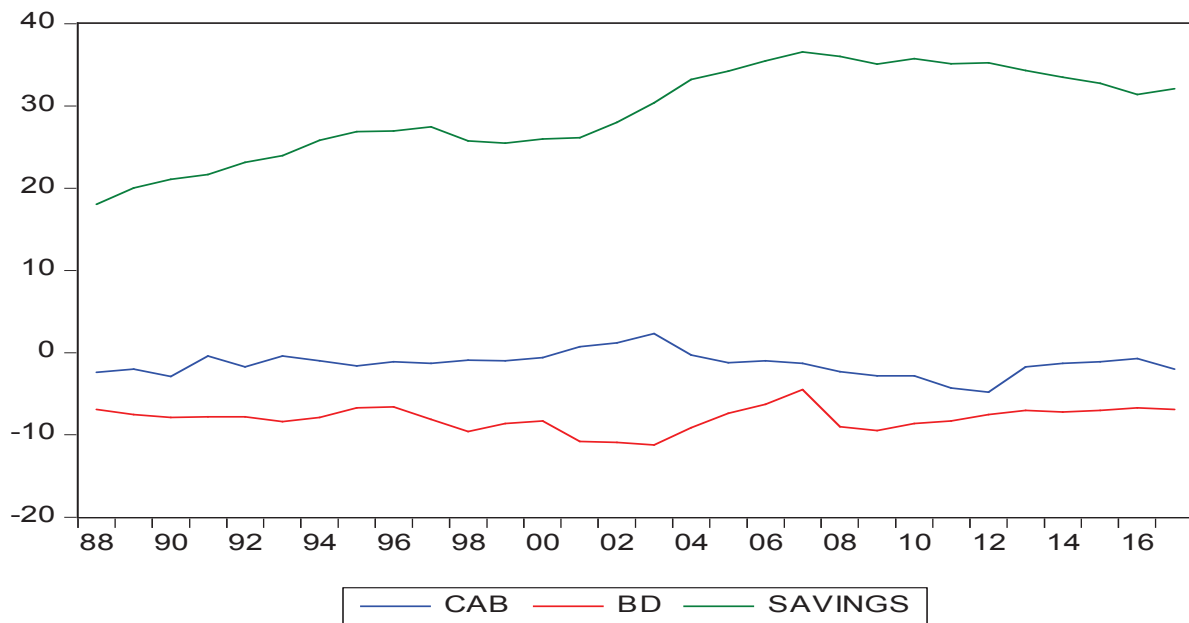
3. DATA AND METHODOLOGY

In the study, the twin deficits hypothesis was examined for the period 1988-2017 for Indian economy. The data set was taken from International Monetary Fund (IMF World Economic Outlook). The basic model equation is as follows:

$$CAB = \alpha_0 + \alpha_1 BD + \mu t \quad (14)$$

CAB refers to Current Account Balance, *BD* refers to Budget Deficit and μt is the error term. Figure 1 reflects the current account balance, budget deficit and savings of Indian economy. Despite the high savings rates, the twin deficits of the Indian economy are remarkable. The horizontal axis represents years and vertical axis represents rates of selected indicators.

Figure 1: Current Account Balance, Budget Deficit and Savings of Indian Economy



The time series approach is used as the econometric method in this study. Firstly, the stationary of the variables was tested using the ADF test. Secondly, the existence of co-integration is tested for variables. As a final step, the Granger causality test was used to determine the direction of the relation.

4. EMPRICAL FINDINGS AND DISCUSSION

The stationary is more important in the time series analysis. Augmented Dickey Fuller (ADF) test is the most commonly used unit root test. The Augmented Dickey Fuller (ADF) unit root test is used to determine whether the variables are stationary or not.

Table 2 reflects the results of unit root tests for current account balance (CAB, % of GDP) and budget deficit (BD, % of GDP).

Table 2. Unit Root Test Results (at Level)

	CAB	BD
t-statistic	-2.447004	-2.657566
Probability	0.3498	0.2599
Critical Values		
1%	-4.309824	-4.309824
5%	-3.574244	-3.574244
10%	-3.221728	-3.221728
H ₀ = CAB has a unit root H ₂ = BD has a unit root. * The H ₀ and H ₂ hypothesis are accepted because the probability value is bigger than 0.05, the series is not stationary. Source: Calculated by Eviews		

Table 2 shows that the current account balance and budget deficit series are not stationary at level. The first differences of these two series have been taken to stationary. Table 3 reflects the results of unit roots for current account balance and budget deficit series at first differences.

Table 3. Unit Root Test Results (at First Differences)

	CAB	BD
t-statistic	-5.913392	-4.810632
Probability	0.0002	0.0032
Critical Values		
1%	-4.323979	4.323979
5%	-3.580623	-3.580623
10%	-3.225334	-3.225334
H ₀ = CAB has a unit root H ₂ = BD has a unit root * The H ₀ and H ₂ hypothesis are rejected because the probability value is smaller than 0.05, the series is stationary. Source: Calculated by Eviews		

The Johansen co-integration test is useful for check existence of long run relationship between current account balance and budget deficit. The first step of the Johansen co-integration test is to determine the appropriate lag length. Critical values such as Akaike, Schwarz and Hannan-Quinn are used to determine the lag length. The lag length providing the smallest critical value is determined as the lag length of the model. The optimal lag length was determined as 5 based on AIC.

The results of Johansen co-integration test is shown in table 4. It is understood that there is co-integration relationship between current account balance budget deficits. Trace test indicates two co-integrating eqn(s) at the 0.05 level and maximum Eigen value test indicates two co-integrating eqn(s) at the 0.05 level.

Table 4: Johansen Co-integration Test Results

Hypothesized no. of CE(s)	Eigen value	Trace statistic	0.05 critical value	Prob.
Unrestricted co-integration rank test (trace)				
None	0.583137	28.18860	12.32090	0.0001
At most 1	0.295730	8.063655	4.129906	0.0054
Unrestricted co-integration rank test (maximum Eigen value)				
None	0.583137	20.12494	11.22480	0.0011
At most 1	0.295730	8.063655	4.129906	0.0054

The Granger Causality test is based on testing the significance of the lagged values of the independent variable in the regression equation (Granger, 1969, pp.424-438). The Granger Causality test was used to determine the direction of causality between the budget deficits and the current account deficit. The variables have to be stationary in order to applying Granger causality test. As mentioned above, it is reached that stationary at first differences by using ADF test. In table 5, the results of Granger Causality test are shown. The direction of the relationship is budget deficit to current account balance. In other words budget deficit does cause current account deficits for Indian Economy

Table 5: Granger Causality Test Results

Dependent variable: CAB(-1)		
Excluded	Chi-sq	Prob.
BD(-1)	16.70660	0.0051
All	16.70660	0.0051

Dependent variable: BD(-1)		
Excluded	Chi-sq	Prob.
CAB(-1)	2.716582	0.7436
All	2.716582	0.7436

5. CONCLUSION

The budget deficit and current account deficit is observed in Indian economy for many years. The twin deficit hypothesis is investigated using co-integration analysis and Granger causality test for 1988-2017 period with annual data. The direction of causality between budget deficits and current account deficit was examined using Johansen co-integration analysis and Granger Causality test. It is concluded that there is a long-run relationship between budget deficit and current account deficit. This result is consistent with the traditional Keynesian twin deficit hypothesis. In addition, the direction of the relationship is budget deficit to current account balance. In other words budget deficit does cause current account deficits for Indian Economy.

Despite the high savings rates, the twin deficits are valid for the Indian economy. This finding is remarkable. The results of the analysis show that the main economic problem is budget deficits for Indian economy. Policy makers should develop policies to budget balance. This will also have positive effects on the current account balance.

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