In this Chapter, we have analyzed the relationship between fiscal deficit and current account deficit in India. The study used autoregressive distributive lag model for finding the results. This chapter is divided into six sections followed by introduction. Section 2 encapsulates the review of recent studies. Section 3 explains the theoretical framework of the study. Section 4 discusses the data source and methodology. Results of the study are discussed in Section 5. Section 6 concludes the chapter.

4.1 INTRODUCTION

Large and persistent budget deficit has occurred together with current account deficit in many industrial countries over the past two decades. The growing fiscal deficit along with steady current account deficits has been an important issue for policy makers in India. Both the current account deficit and budget deficit in India increased extensively in late eighties. The increasing trend of CAD and fiscal deficit led several researchers to reach the conclusion that there is a mutual relationship between them. The theoretical explanation of twin hypothesis based on Mundell-Fleming Model of open economy is popularly known among researchers. This model emphasizes that an increase in the budget deficit puts an upward pressure on rate of interest to attract foreign investors, which results in appreciation of exchange rate and finally leads to a current account deficit (Saeed & Khan, 2012). According to Keynesian view the budget deficit has a significant impact on current account deficit. Keynesian approach asserts that an increase in fiscal deficit will lead to increase in domestic absorption and also the purchasing power. This results in import expansion thereby, causing the problem of current account deficit in the economy.
India has experienced high level of fiscal deficit and current account deficit in eighties that altogether accumulated in external crisis in early nineties. Presently, the fiscal deficit and current account deficit are again at a high level (average fiscal deficit after enactment of FRBM act, 2003 is 4.83 percent of GDP and average current account deficit is 2.2 percent of GDP). Can it cause external crisis again that happened in early nineties? Is there a need for new economic reforms? Therefore, it is important to redefine and revaluate the presence of twin deficit relationship in India. If it exits, what kind of relationship do they have; whether it is short run relationship or long run relationship? However, before investigating the data empirically, it is important to find some facts about the twin deficits in India during last three decades. Average fiscal deficit in eighties was 6.56 percent of GDP, declined to 5.72 percent in next decade and further came down to 4.77 percent of GDP in 2000s. On the other hand, average current account deficit as percentage of GDP decreased from -1.8 percent in 1980’s to -1.2 in 1990’s and further came down to -0.5 percent.

Theoretically, four hypothesizes are there to explain the relationship between fiscal deficit and current account deficit. The first hypothesis is based on Keynesian view that cut in the tax rate reduces the national saving by increasing private disposable income which leads to increase the domestic absorption and also increase in imports, causing deterioration of current account balance and affects all macro relationship between fiscal deficit and current account deficit. This results in twin deficit phenomenon. Some researchers supported the Keynesian view that budget deficit causes the current account deficit and are closely related (Bernheim, 1987; Darrat, 1988; Abell, 1990; Ziet and Pemberton, 1990; Bachman1992; Rosensweig & Tallman, 1993; Bahmani-Oskooee, 1995; Egwaikhide, 1999; Vamvoukas, 1999; Chinn & Prasad, 2000; Kulkarni & Erickson, 2001; Margani & Ricciuti, 2004; Mohammadi, 2004; Piersanti, 2000; Parikh & Rao, 2006; Samadi, 2006; Saleh & Nair, 2006; Akbostanci & Tunc, 2006; Hakro, 2009 and Ratha, 2010).

The second school of thought is known as Ricardian Equivalence Hypothesis (REH). This approach holds the view that substitution of debt for taxes has no effect
on aggregate demand or on rate of interest for specific expenditure path of the economy. According to Ricardian proponents, tax payers do not feel better off even though their current disposable income may have increased because they know that cut in the current taxes would be balanced by increase in future taxes (Aqeel & Nishat, 2000). It implies that private spending or national saving is not affected by tax financed expenditure. An inter-temporal transfer between taxes and budget deficit would have no effect on interest rate or the current account deficit. Some researchers (Barro, 1974; Evan, 1988; Miller & Russek, 1989; Dewold & Ulan, 1990; Enders & Lee, 1990; Kim, 1995 and Becker, 1997) supported the Ricardian Equivalence Hypothesis that the budget deficit is not the reason for current account deficit. The third hypothesis popularly known as Neo-classical view according to which an increase in current account deficit puts a burden on government to expand more. This results in increase in government expenditure, hence widening the fiscal deficit. This view received empirical support by many researchers (Anoruo & Ramchander, 1988; Bussiere et al., 2005; Kim & Kim, 2006; Marashdeh & Saleh, 2006 and Kim & Roubini, 2008). Finally, the bi-directional hypothesis asserts that there is two way relationships between fiscal deficit and current account deficit (Islam, 1998 and Mukhtar et al., 2007).

Furthermore, many studies have been conducted with Indian data. Anoruo and Ramchander (1998) empirically studied data for five developing economies against the backdrop of Asian economic crises and found that trade deficit causes fiscal deficit and not vice versa. Their findings are contrary to most of findings in the literature and pointed out that government in developing countries have to engage in providing stimulus package to lessen the consequence of large current account deficit (Bose & Jha, 2011). Kulkarni and Erickson (2001) using data over the time period 1969-1996 found that budget deficit granger cause trade deficit in India. Kouassi et al. (2004) found no casual relationship between fiscal deficit and current account deficit during the time periods of 1975-1997 in a sample of twenty developed and developing countries. Basu & Datta (2005) examined that twin deficit doesn’t exist in India. By using data for over three decades of Indian economy, Parikh & Rao (2006) analysed that fiscal deficit significantly contribute to CAD.
Ratha (2010) founds that twin deficit hypothesis holds for India in short run and in long run evidences are in favour of REH that negates any long run relationship between current account deficit and fiscal deficit.

4.2 REVIEW OF LITERATURE

The literature on relationship between fiscal deficit and current account deficit is very rich. Several empirical studies examined the twin deficit problem in developed countries. However, the number of studies which examined the long run relationship between budget deficit and current account deficit in developing countries are very scarce. Some researchers (e.g. Fleming, 1962; Mundell, 1963; Kearney & Monadjemi, 1990) suggested that government budget deficit may cause current account deficit through different routes.

Fieleke (1987) studied the relationship between trade deficit and budget deficit. The study found that an increase in government borrowing from internal and external sources will increase pressure on interest rates and further it will deteriorate the current account balance of the country.

Volcker (1987) studied the budget deficit and trade deficit and concluded that trade deficit is the result of budget deficit. Further, the study argued that both trade deficit and budget deficit hamper GDP growth rate of a country in the long-run.

Miller and Russek (1989) advocated that there is a direct relationship between budget deficit and trade deficit. While studying the USA economy, the study found that trade deficit is the result of fiscal deficit.

Enders and Bong-Soo (1990) found that increases in public spending, despite of the means of finance, can be likely to persuade current account deficit.

Kearney and Monadjemi (1990) found that fiscal expansions would lead to improve current account performance in long run. The study further found that government financing decision does not play an important role in existence of twin deficit problem.

Normandin (1996) found the causal relationship between external and budget deficits by using Blanchard’s overlapping generations model to test whether
there is a positive relationship on one hand and the Ricardian Equivalence (i.e. there is no causal link between the twin deficits), on the other. The study found the relationship between the twin deficits to be significantly positive.

Thorbecke (1993) affirms the positive link between the twin deficits. He argued that a decrease in the budget deficit would trim down surplus spending and lesser the trade deficit.

Perkins (1997) advocated that government spending plays an important role in determining the current account balance. The study found that reduction in public spending leads to lower the current account balance in a country.

Islam (1998) investigated empirically the causal association between the trade deficit and budget deficit for Brazil. The study found that two-way causality exists between budget deficit and trade deficit.

Egwaikhide (1999) studied the association between budget deficit and trade deficit in Nigeria. The study found that budget deficit arising from augmented public spending is negatively related with balance of trade despite it is money-financed or financed by outside borrowing.

Khalid and Guan (1999) investigated the association between current account deficit and budget deficit in five developed economies. The study found no cointegration between the budget deficit and current account deficit in developed economies.

Normandin (1999) used VAR model in US and Canada on the quarterly data over the period of 1950-1992 to examine the relation between current account deficit and budget deficit. His study reveals that lump sum tax cut that increases the budget by 1 unit, deteriorates the real current account balance by 0.21-0.98 units for US and by 0.19-0.67 units for Canada.

Piersanti (2000) investigated the association between budget deficit and the current account deficit for seventeen OECD countries over the period 1970-1997. The study used Granger-Sims causality technique to examine the relationship. The study found that budget deficit and the current account deficit are positively associated with each other in long run.
Kim and Roubini (2004) analyzed that in United States, 1 percent of gross domestic product (GDP) increase in government primary deficit improves the current account balance by less than 0.1 percent of gross domestic product for about a year and impact vanish afterward. They used VAR to analyze the quarterly data for the period of 1973-2004. The reason for improvement in the current account comes from the effect of higher saving and lower saving as interest rate increase.

Bussiere and Fratzscher (2005) conducted research on annual data of G7 and 21 OECD countries over the period of 1960-2003. The result of panel and country specific time series regression shows that 1 percent of gross domestic product increase in the episodically adjusted primary budget deficit does not significantly affect current account of G7 countries but marginally (0.7 percent of GDP) affects the current account of OECD countries. They concluded that productivity seems to play more significant role.

Cavallo (2005) aptly described the problematic relationship of the twin deficits when he said that sibling relationships were always complicated. He noted that despite theoretical postulates that deterioration in the budget balance results in a deterioration of current account balance, the two siblings did not always move together. For policy makers this raises questions as to whether a reduction in the deficit would necessarily lead to an improvement in the current account balance.

Kennedy and Slock (2005) found that 1 percent of GDP increase in government budget balance improves the CA balance by about 0.3 percent of GDP in 14 OECD countries (1982-2003) and used panel regression.

Corsetti and Miller (2006) found the negative relationship between government spending and trade balance in Australia, Canada, UK and in US using quarterly data over the period of 1980-2006. They found that one percent increase in government spending (% of GDP), deteriorates trade balance by 0.5 percent of GDP for UK, 0.17 percent of GDP for Canada but does not show significant effect for US and Australia.

Beetsma et al. (2007) found the relationship between government spending and trade balance in 14 EU countries using annual data over the period of 1970-2004. The results of Panel VAR 2 showed that 1 percent of GDP increase in
government spending deteriorates the trade balance by 0.5 percent of GDP on impact and 0.8 percent of GDP after 2 years and after a year, real effective exchange rate appreciates.

**Monacelli and Perotti (2007)** investigated the relationship between government spending and trade balance in US, UK, Canada and Australia over the period of 1975-2006. Using VAR model, it was found that increase in government spending (percentage of GDP) by 1 percent, deteriorates trade balance (>0.6% of GDP) sharply in UK (after 5 quarters) and Australia (after 3 quarters) but does not change significantly for US and Canada. Further they found that by one year, the real effective exchange rate depreciates by 4 percent in US and Australia and by 2 percent in UK and Canada but after 2 years it starts appreciating in Canada.

**IMF (2008)** investigated the relationship between government consumption and real exchange rate in 48 countries over the time period of 1980-2004 and the results of panel Cointegration showed that 1 percent of GDP increase in government consumption appreciates the real exchange rate by 2.5 to 3 percent.

**Abiad et al. (2009)** found that 1 percent of GDP increase in budget balance improves the current account balance by 0.3 percent (of GDP). The coefficient becomes insignificant in regression with regional sub samples of mostly advanced and emerging economies.

**Anas (2013)** analyzed the twin deficit hypothesis in Morocco. The results of VAR model and the Granger-causality test showed that unidirectional causality is moving from the current account deficit to the fiscal deficit.

**Agarwal (2014)** examined the relationship between current account deficit and fiscal deficit in India from 2000-01 to 2012-13. Johansen Cointegration test at 5% level showed the presence of stationary linear combination between CAD and FD. Granger causality test showed unidirectional relationship between CAD and Fiscal Deficit that fiscal deficit is caused by CAD not vice versa.

**Coban and Balikcioglu (2016)** investigated triple deficit hypothesis for 24 transition economies over the period of 2002 to 2013. The results of dynamic panel data analysis found positive relationship between fiscal deficit and current account deficit.
Sen and Kaya (2016) investigated the relationship between fiscal deficit, private saving-investment balance and current account deficit over the period of 1994-2012 in Russia, Poland, Ukraine, Romania, the Czech Republic, and Hungary. The results of bootstrap panel Granger causality test indicate that there is no evidence of the twin and triple deficits hypothesis in the studied nations.

Ramu (2017) investigated the long run relationship between fiscal deficit and current account deficit over the period of 1980-2013. The study used Johansen co-integration method and vector error correction model. The results found long run co-integration between fiscal deficit and current account deficit in India.

4.3 THEORETICAL FRAMEWORK

The theoretical relationship between fiscal deficit and current account deficit can be traced from national income identity (Tahir et al., 2007)

\[ Y = C + I + G + (X - M) \]  
Eq. 1

Here

\( Y \) = national income
\( C \) = private consumption expenditure
\( I \) = Investment Expenditure
\( G \) = Government Expenditure
\( X \) = Export
\( N \) = Import

According to national income identity, in open economy national savings is:

\[ S = \text{Private Saving} + \text{Public Saving} \]

\[ S = (Y - T - C) + (T - G) \]  
Eq. 2

\[ S = Y - C - G \]  
Eq. 3

Replacing the value of \( Y \)

\[ S = C + I + G + NX - C - G \]  
Eq. 4
Alternatively, the equation can be written as

\[ S = I + NX \]  \hspace{1cm} \text{Eq. 5}

Where national saving is (S) is the sum of private and public saving

\[ S = S_{pt} + S_{pb} \]

\[ S_{pt} = I + NX - S_{pb} \]  \hspace{1cm} \text{Eq. 6}

\[ S_{pt} - I + (T - G) = NX \]

\[ NX = S_{pt} - I + (T - G) \]

When government expenditure is more than revenue, then (G-T) reduce the national saving instead of increasing it. Thus high deficit negatively affects the national saving. If, \( T > G \) indicates budget surplus (BS). But in case of India \( T < G \), the Government budget is in deficits (BD). The balance budget occurred when \( T = G \). The twin deficits hypothesis can be expressed in the following relation.

\[ NX = S_{pt} - I - (G - T) \]

\[ NX = [S_{pt} - (G - T)] - I \]  \hspace{1cm} \text{Eq. 7}

The right hand side of the equation is difference between national saving and investment. The impact of increasing fiscal deficit in increasing current account deficit could be one aspect of the twin deficit phenomenon. Another perspective could be positive effect of budget deficit on interest rate (Vamvoukas, 1997). Increase in interest rates will attract foreign investment and appreciate the domestic currency, which implies cheaper imports and expensive exports, pushing the current account towards deficit. Government budget deficits reduce national saving which results in decline in supply of loans in market and increase interest rate. Further, it leads to reduction in domestic investment and also reduces productive capacity of the country. Appreciation of currency resulting from increased foreign investments leads to decline in exports and increase in imports deteriorating the current account balance (Ball and Mankive, 1995). When deficits reduce investment, the capital stock grows more slowly and if deficits continue for a decade or more, they can significantly reduce the economy’s productive capacity.
The behaviour of India’s twin deficit (fiscal deficit and Current account deficit) is traced in Figure 4.1. Enlarged fiscal deficit and current account deficit during 1980’s created balance of payment crises of 1991. Fiscal deficit as the percentage of GDP was very high in 1980’s caught the attention of Government towards enlarging fiscal deficit. India’s fiscal deficit came down to 5.19 percent in 1992-93 from 7.61 percent in 1990-91. After 1991 economic reforms, government was able to control fiscal deficit but it was still above 5 percent. However, government has been able to bring it down to 2.54 percent after implementation of Fiscal Responsibility and Budget Management ACT, 2003. On the other hand, CAD was very high in late eighties but it had been trending lower (improving current account balance) since the mid 1990s till 2004-05. Government has taken many corrective measures to control CAD and been able to trim down it to 0.4 percent in 1991-92 from 3 percent in 1990-91. However, it increased thereafter and reached to 1.7 percent in 1995-96. India had current account surplus in consecutive three years (2001-02 to 2003-04). As the global economic crisis erupted in 2008, India’s CAD jumped from 1.3 percent in 2007-08 to 2.08 percent in 2009-10 and further reached at a peak level of 4.7 percent in 2012-13; while fiscal deficit jumped from 2.54 percent to 6.46 percent during the same time period. The economic crisis not only deteriorated current account balance as India’s exports declined more than imports,
fiscal deficit was also affected adversely because of the necessity to provide effective stimulus package during the peak crises period. Further, the outflow of capital is taking place in India partly due to high CAD, hurting overseas investors’ confidence for making investment in Indian economy.

4.4 DATA SOURCE AND METHODOLOGY

The objective of the present study is to test empirically the validity and rationale of Keynesian Hypothesis and Ricardian Equivalence hypothesis, as well as to analyze the relationship between fiscal deficit and current account deficit. The study covers the period from 1980 to 2013 for India. The data for fiscal deficit, current account deficit, gross domestic capital formation and money supply (broad money) have been taken from Handbook of Statistics of Indian economy of various years. The data on fiscal deficit, current account deficit, gross domestic capital formation and money supply are converted into percentage term and measured as ratio to gross domestic product at market price. In the present study ARDL approach has been used to find the long run relationship among variables. The ARDL approach has some advantages when compared with other cointegration methods such as the two-step approach by Engle and Granger (1987) and the Johansen test (1988). The ARDL bounds testing approach for cointegration does not require analysis of singular integration unlike other approaches such as Johansen and Juselius (1990). This approach is used to analyze the long-run relationship between all series as it can outfit for small sample size. Also, it is applicable irrespective whether the regressors in the model are I(0), I(1) or both. In order to run the model, this study used EVIWS-9. The following equation has been used in this analysis

\[ CAD = b_1 + b_2FD + b_3GCFGDP + b_4MMP + e \]

where

- CAD is current account as percentage of GDP at market price
- FD is fiscal deficit as percentage of GDP at market price
- GCFGDP is gross domestic capital formation as percentage of GDP at market price
- MMP is broad money as percentage of GDP at market price
- \( b_1 \) is the intercept value
- \( b_2, b_3 \) and \( b_4 \) are coefficients of FD, GCFGDP and MMP
- e is error term
Model Equations

\[ \Delta CAD_t = \beta_0 + \sum_{i=0}^{k}\beta_i \Delta CAD_{t-i} + \sum_{i=0}^{k}\beta_i \Delta FD_{t-i} + \sum_{i=0}^{k}\beta_i \Delta GCFGDP_{t-i} + \sum_{i=0}^{k}\beta_i \Delta MMP_{t-i} + \alpha_1 CAD_{t-i} + \alpha_2 FD_{t-i} + \alpha_3 GCFGDP_{t-i} + \alpha_4 MMP_{t-i} + e_t \]

\[ \text{------------- (Eq.1)} \]

where

\( \Delta \) = operator of first-difference
\( \beta_0 \) = intercept
\( t \) = time
\( \beta_1, \beta_2, \beta_3, \beta_4 \) = short run dynamic association
\( \alpha_1, \alpha_2, \alpha_3, \alpha_4 \) = long run dynamic association
\( e_t \) = white noise error term

In the ARDL model, the bounds test is adopted to determine whether the cointegration exists or not. The bounds test considered jointly significance of the \( F \) statistic and the \( \chi^2 \) statistic of Wald test. Here the current account deficit (CAD) acts as the dependent variable and the fiscal deficit (FD), gross domestic capital formation as percentage of GDP at market price (GCFGDP) and broad money as percentage of GDP at market price (MMP) are assumed as explanatory variables. The hypothesis to examine existence of cointegration between them is expressed as follows:

\[ H_0 \rightarrow \alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = 0 \] (No cointegration)

\[ H_1 \rightarrow \alpha_1 \neq \alpha_2 \neq \alpha_3 \neq \alpha_4 \neq 0 \] (Cointegration exists)

The null hypothesis of no cointegration is tested by examining the joint significance of the \( F \) statistic of \( \alpha_1, \alpha_2, \alpha_3, \alpha_4 \).

The ARDL has been chosen as it is possible to find cointegration even if variables have different optimal number of lags. The ARDL bound test is based on the Wald-test (F-statistic).
If computed F-statistic > the upper bound critical value, then the \( H_0 \) is rejected
(the variables are cointegrated)

If the F-statistic < lower bound critical value, then the \( H_0 \) cannot be rejected
(there is no cointegration among the variables)

When the computed F-statistics falls between the lower and upper bound, then the results are uncertain.

Further, if there exists cointegration between the variables, an error correction mechanism (ECM) can be developed as

\[
\Delta CAD_t = \beta_0 + \sum_{i=0}^{k} \beta_i \Delta CAD_{t-1} + \sum_{i=0}^{k} \beta_2 \Delta FD_{t-1} + \sum_{i=0}^{k} \beta_3 \Delta GCFGDP_{t-1} + \sum_{i=0}^{k} \beta_4 \Delta MMP_{t-1} + \lambda ECM_{t-1} + \mu_t
\]

--------- (Eq.2)

Where

\( ECM_{t-1} \) = error correction term

\( \mu_t \) = error term

\( \lambda \) = coefficient of the error correction term which shows the speed of adjustment of the variables to equilibrium in long run

Cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) tests are used to check the long run stability of the parameters.

**4.5 RESULTS AND INTERPRETATIONS**

Augmented Dickey Fuller Test is used to check the stationarity of data. The test for unit root is to insure that none of series is integrated at \( I(2) \) or higher. The results of ADF test developed by Dickey and Fuller (1981) are demonstrated in Table 4.1 which depicts that data was not stationary at level. All the variables have been found stationary at first difference. Therefore, the data set for this study has integrated at \( I(1) \). The optimal lag length of the long run coefficient is found 1 by using the lag selection criteria of AIC and SBC.
To find the long run relationship, Auto Regressive Distributive Lag Model (ARDL) was used and estimated results are reported in Table 4.2. The results of ARDL approach confirm the existence of long run relationship between current account deficit and its factors like fiscal deficit, gross domestic capital formation and money supply. The estimated probability value of Jarque Bera test is found significant which revealed that error term is normally distributed. The probability value of LM test and white test are not significant which shows that data are free from serial correlation and no hetroscedasticity problems in this study. P value of Durbin Watson is close to 2 indicates that no autocorrelation in the model.

### Table 4.1
Results of Unit Root Test

<table>
<thead>
<tr>
<th>Variables</th>
<th>At Level</th>
<th>At first Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>t-Statistics</td>
<td>Prob.</td>
</tr>
<tr>
<td>CAD</td>
<td>-2.335107</td>
<td>0.1675</td>
</tr>
<tr>
<td>FD</td>
<td>-2.479965</td>
<td>0.1293</td>
</tr>
<tr>
<td>GCFGDP</td>
<td>-1.496130</td>
<td>0.5231</td>
</tr>
<tr>
<td>MMP</td>
<td>0.289460</td>
<td>0.9741</td>
</tr>
</tbody>
</table>

Note: * indicates significance at 5% level
Table 4.2
Selected Model: ARDL (1, 1, 0, 1)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAD(-1)</td>
<td>0.518195</td>
<td>0.086146</td>
<td>6.015289</td>
<td>0.0000*</td>
</tr>
<tr>
<td>FD</td>
<td>0.434412</td>
<td>0.118420</td>
<td>3.668414</td>
<td>0.0011*</td>
</tr>
<tr>
<td>FD(-1)</td>
<td>-0.217106</td>
<td>0.123653</td>
<td>-1.755768</td>
<td>0.0909</td>
</tr>
<tr>
<td>GCFGDP</td>
<td>0.286776</td>
<td>0.051752</td>
<td>5.541354</td>
<td>0.0000*</td>
</tr>
<tr>
<td>MMP</td>
<td>-0.232712</td>
<td>0.058770</td>
<td>-3.959702</td>
<td>0.0005*</td>
</tr>
<tr>
<td>MMP(-1)</td>
<td>0.161332</td>
<td>0.063396</td>
<td>2.544809</td>
<td>0.0172*</td>
</tr>
<tr>
<td>C</td>
<td>-3.868087</td>
<td>1.212731</td>
<td>-3.189566</td>
<td>0.0037*</td>
</tr>
</tbody>
</table>

Note: * indicates significance at 5% level
R-squared=0.848797, Adjusted R-squared=0.813904, F-statistic=24.32579, Prob(F-statistic)=0.000000, P-value of Jarque Bera Test = 0.027245, P-value of LM test=0.05410, Heteroskedasticity White Test= 0.2303, P-value of Durbin Watson= 2.21203

The estimated results of bound test are reflected in Table 4.3 that revealed that calculated value of F statistics is 5.45277 which is greater than its corresponding critical value of upper bound at five percent level of significance. It confirms the long run relationship between current account deficit and its factors like fiscal deficit, gross domestic capital formation and money supply. The above results confirm that fiscal deficit and gross domestic capital formation have positive and significant long run relationship with current account deficit. Further money supply has negative and significant relationship with current account deficit in India in long run. However, in Keynesian economy fiscal deficit increases domestic absorption in the economy which results in increase the demand for imports, thereby deteriorating the current account deficit. The other effect of increased fiscal deficit is through increased interest rate, causes domestic currency to appreciate, hence increase imports. Thus it will lead to current account deficit.

Our results support the twin deficit hypothesis in India. India is a developing country and depends upon other countries for technology, capital goods and oil. Its
import is driven mainly by capital goods which increases the gross capital formation by multiplier effect. Thus the results showed that increase in gross domestic capital formation results in worsen the current account deficit. The above results also showed that increase in money supply helps in improving current account. Increase in money supply in the economy leads to reduction in interest rates. Domestic currency will become less productive for foreign players, so it will reduce foreign investment. These altogether cause depreciation in the exchange rate. This depreciation makes exports more attractive and imports less competitive results in significant improvement in current account. Thus increase in money supply helps in reducing current account deficit in India. Thus the results assert the Keynesian theory according to which fiscal deficit is the reason for high current account deficit in the country. Further, the results are supported by many researchers (Bernheim, 1987; Darrat, 1988; Abell, 1990; Ziet & Pemberton, 1990; Bachman, 1992; Rosensweig & Tallman, 1993; Samadi, 2006; saleh & Nair, 2006; Akbostanci &Tunc, 2006; Hakro, 2009 and Ratha, 2010).

The cumulative sum of recursive residuals (CUSUM) is represented in Figure 4.2 which shows that coefficient of the long run lies within the critical limits and reveals stability in the coefficients over the sample period at five percent level of significance.
Figure 4.2
Plot of Cumulative Sum of Recursive Residuals

Table 4.3
Results of Bounds Test

<table>
<thead>
<tr>
<th>Significance</th>
<th>I0 Bound</th>
<th>I1 Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>2.37</td>
<td>3.2</td>
</tr>
<tr>
<td>5%</td>
<td>2.79</td>
<td>3.67</td>
</tr>
<tr>
<td>2.5%</td>
<td>3.15</td>
<td>4.08</td>
</tr>
<tr>
<td>1%</td>
<td>3.65</td>
<td>4.66</td>
</tr>
</tbody>
</table>
Table 4.4
Error Correction Representation for the Selected ARDL Model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.431746</td>
<td>0.175807</td>
<td>2.455798</td>
<td>0.0220</td>
</tr>
<tr>
<td>D(CAD(-1))</td>
<td>-0.022063</td>
<td>0.196461</td>
<td>-0.112303</td>
<td>0.9116</td>
</tr>
<tr>
<td>D(FD(-1))</td>
<td>0.063879</td>
<td>0.139734</td>
<td>0.457145</td>
<td>0.6519</td>
</tr>
<tr>
<td>D(GCFGDP(-1))</td>
<td>-0.011854</td>
<td>0.093701</td>
<td>-0.126507</td>
<td>0.9004</td>
</tr>
<tr>
<td>D(MMP(-1))</td>
<td>-0.161866</td>
<td>0.074875</td>
<td>-2.161810</td>
<td>0.0413</td>
</tr>
<tr>
<td>D(FD)</td>
<td>0.503149</td>
<td>0.113612</td>
<td>4.428645</td>
<td>0.0002</td>
</tr>
<tr>
<td>D(GCFGDP)</td>
<td>0.247114</td>
<td>0.063125</td>
<td>3.914660</td>
<td>0.0007</td>
</tr>
<tr>
<td>D(MMP)</td>
<td>-0.212332</td>
<td>0.067668</td>
<td>-3.137855</td>
<td>0.0046</td>
</tr>
<tr>
<td>ECT(-1)</td>
<td>-0.653886</td>
<td>0.204299</td>
<td>-3.200638</td>
<td>0.0040</td>
</tr>
</tbody>
</table>

R-squared=0.751476, Adjusted R-squared= 0.665033, F-statistic=8.693297,
Prob(F-statistic)= 0.000021, Durbin-Watson stat=2.239478, P value of Jarque Bera=0.076483,
Heteroscedasticity=0.3803, Serial Correlation LM Test ( P value) =0.0750

Table 4.5
Wald Test Results

<table>
<thead>
<tr>
<th>Variables(Null Hypothesis: C(2)=C(3)=C(4)=C(5)=0)</th>
<th>P value of Chi Square (Wald Test)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C(2)=0</td>
<td>C(2)=CAD</td>
</tr>
<tr>
<td>C(3)=0</td>
<td>C(3)=FD</td>
</tr>
<tr>
<td>C(4)=0</td>
<td>C(4)=GCFGDP</td>
</tr>
<tr>
<td>C(5)=0</td>
<td>C(5)=MMP</td>
</tr>
</tbody>
</table>

After estimating long run coefficients, the next step in ADRL model is to estimate error correction term and estimation of short run coefficients. The results of error correction model are summarised in Table 4.4. The existence of stable long run relationship is further confirmed by significant error correction term (Bannerjee & Mestre, 1998). The test is denoted as an error correction mechanism test and is based upon the ordinary least squares coefficient of the lagged dependent variable in an autoregressive distributed lag model augmented with leads of the independent variables. According to the results given in the Table 4.4, error correction term is negative and significant that confirms the long run relationship among variables and
shows the speed of adjustment towards long run equilibrium. The results suggest that following a shock, around 65 percent adjustment will be completed after one year and this long run equilibrium will be resorted in approximately 1.52933 years (1/0.65388=1.52933). The robustness of short run results is investigated through diagnostic and stability tests. The diagnostic tests such as LM test for serial correlation, white heteroscedasticity and model specification test have been conducted. The results are reported in the lower segment of Table 4.4. Serial correlation LM test suggests no serial correlation and probability value of White Test reports no heteroskedasticity in residuals. The empirical findings show that short-run model seems to pass all diagnostic tests successfully. Pesaran & Shin (1999) have suggested checking the stability of long run and short run estimates through CUSUM and CUSUM Square tests. Cusum (Figure 4.3) and Cusum square plots (Figure 4.4) also demonstrate coefficient in the critical limits and indicate the stability in coefficient over the sample period in short run. Both tests also verify the stability of ARDL model for structural stability. This indicates that model seems to be steady and specified appropriately.

Moreover, it is apparent that in short run, the impact of fiscal deficit and gross domestic capital formation on current account deficit is insignificant. But money supply has negative and significant impact on current account deficit meaning that increase in money supply helps in strengthen the current account in short run also. Further, the results of short run relationship are also verified with Wald Test. The results in Table 4.5 confirm that fiscal deficit and gross domestic capital formation do not have short run relationship but money supply has negative and significant relationship with current account deficit. Thus the results support the Ricardian approach which asserts that there is no relationship between fiscal deficit and current account deficit. Many studies (Barro, 1974; Evan, 1988; Miller & Russek, 1989; Dewold & Ulan, 1990; Enders & Lee, 1990; Kim, 1995 and Becker, 1997) also negate the short run relationship of fiscal deficit and current account deficit.
4.6 SUMMARY AND CONCLUDING REMARKS

High current account deficit coupled with fiscal deficit is one of the debatable issues among economists. The large current account deficit poses a great challenge for Indian economy to control it. Our foreign exchange reserves are not sufficient to finance CAD. On the other hand fiscal deficit is increasing very rapidly. The present study aims at exploring the relationship between current account deficit
and fiscal deficit in India. In a Keynesian economy, fiscal deficit stimulates the absorption in the economy, causes import expansions and thereby deteriorates current account deficit in the country.

Using time series annual data over 1980-81 to 2013-14 and Autoregressive distributive lag model, the study demonstrated that fiscal deficit and gross capital formation are positively related with current account deficit in long run. Fiscal deficit increases domestic absorption in the economy which results in increase the demand for imports, causing the current account deficit. As India is growing economy, its import is mainly dominated by capital goods, technology and oil. These altogether increase gross domestic capital formation and are also the reason for current account deficit which is also reflected in the results. However, money supply has negative and significant impact on current account deficit in long run which confirms that expansionary monetary policy in India results in decline in interest rate, cause currency to depreciate. This depreciation makes exports more attractive and imports less competitive, results in significant improvement in current account. Further, bound test results showed that calculated value of F statistics is 5.45277 is greater than its corresponding critical value of upper bound at five percent level of significance. Hence, confirms the long run relationship among variables and supports the twin deficit hypothesis. Cumulative sum of recursive residuals also reports the stability of coefficient in long run.

Furthermore, the results of error correction model report that error correction term is negative and significant that confirms the long run relationship among variables and shows the speed of adjustment towards long run equilibrium. The results suggest that following a shock, around 65 percent adjustment will be completed after one year. The empirical results also showed that fiscal deficit and gross domestic capital formation do not have significant relationship with current account deficit in short run. Moreover, the results reports that money supply has negative and significant relationship with current account deficit in short run also. Cusum and Cusum square plots indicate the stability in coefficient over the sample period. Thus, the findings confirm Keynesian hypothesis in long run and Ricardian
hypothesis in short run. The results of the present study contradict Ratha (2012) who found that twin deficit theory holds in short run but in long run validating Ricardian Equivalence Hypothesis in India.

Growing current account deficit may not necessarily be the cause of concern mainly for a growing economy, but current account deficit coupled with high fiscal deficit could lower the country’s rating and could be the reason for capital flight and depreciation of rupee. Therefore, foreign investment directly or indirectly is not coming in sufficient quantity. However, when twin deficit theory exists, then taming one deficit will also cultivate other deficit. India is a growing economy so could not curtail its spending for development purposes to reduce fiscal deficit rather could boost tax revenue as there is room for growth. Broadening tax base, cutting tax loophole and checking corruption are some steps that will help in reducing fiscal deficit. The study recommends that for the purpose of macroeconomic stability, this is not the right time to reduce expenditure side when economy is facing infrastructure bottlenecks, poverty, technology bottlenecks and supply side constraint. The better composition of government expenditure has a longer impact on the society. Government expenditure for productive purpose will enhance domestic production, employment which will further enhance the volume of exports. The only solution to improve current account deficit is to frame economic policies that will improve productivity of manufacturing sector and attract foreign direct investments. Therefore, increase in government revenue helps in reducing fiscal deficit one side and on the other hand problem of large current account deficit would be tackled due to increase in the volume of exports.