CHAPTER 2
LITERATURE REVIEW

2.1 Introduction.

The phase twin deficit first emerged in eighties mainly in US economy as a result most of the literature reviewed covered United States of America. This chapter relates to the theories as well as models identified by different scholars from developed as well as less developed countries for the estimation of twin deficit. These intellectuals' attempts to find out the link between current account deficit and budget deficit and its impact on different macroeconomic variables like foreign exchange, inflation and interest rate etc.

It draws attention of researchers in 1980's to find out the link between budget deficit and current account deficit. At that time record CAD and BD emerged in many countries, including the United States. The twin deficit hypothesis asserts that an increase in BD will cause a similar increase in CAD. But results of testing this hypothesis turned out different for different countries. In the preceding chapter we saw that the issue of relationship between BD and CA balance is quite complicated. Budget deficit may influence investment, private savings and current account because financing government budget deficit may change interest rate or exchange rate in the economy. At the same time, fiscal policy is itself derived from the existing macroeconomic framework. The government may subsidize exporters if an external shock deteriorates domestic terms of trade or government may increase investment spending in the economy if private sector investment is insufficient because of poorly defined property rights or because of underdeveloped financial institutions. It is understood that the twin deficit hypothesis may or may not hold depending on the whole set of macroeconomic conditions. Henceforth, it has become very important for research to find empirical evidence of a relationship between the two deficits.

This section focuses on a review of the empirical literature on the relationship between the twin deficits. It examines the origin of the twin deficit hypothesis, some stylized facts on the twin

deficit phenomenon in India, theoretical foundations, methodological review and a review of empirical work on the twin deficits.

2.2 The Origin of the Twin Deficit Hypothesis.

According to Egwaikhide et al (2002), before the mid-1970s, most studies focused on the effects of budget deficits on macroeconomic variables like domestic investment, output and interest rates within a closed economy. But with the emergence of current account and budget deficits in the United States in the 1980s, economists became more pre-occupied with the effects of fiscal policy on international variables such as current account balance and exchange rates. Also, the simultaneous emergence of the two deficits during the mid-1980s for other economies led to the characterization of the double deficit phenomenon as the "twin deficits" issue and strengthened the interest of economists in the issue. As put by Egwaikhide et al (2002), the apparently similar movement in both deficits gave rise to the idea that there might be a relationship between the two deficits.

Ganchev (2010) also pointed out that the idea that the current account deficit may be connected in some way to the fiscal situation and that having internal and external deficits at the same time may be risky for the economy is usually associated with the International Monetary Fund (IMF) and the name Jacques J. Polak. Polak was one of the founders of the monetary approach to the balance of payment and he argued that the increase in domestic credit could have a lasting negative impact on the current account. A vast body of literature has however come up trying to establish the relationship between the two deficits. Over the years, there has been a growing body of empirical literature testing the validity of the twin deficits for a number of developed and developing countries.

The idea of the twin deficit hypothesis is that a rise in government budget deficits accompanied by real appreciation of the national currency will adversely affect the current account balance. Though as argued by Brian (undated), there is empirical evidence to support the relationship between both the budget and trade deficits, there is no consensus as to the directionality of the relationship. Investigators have strived to explain the causal relationship between the budget deficit and the current account deficits. The conventional Keynesians used the Mundell-Fleming

framework to explain the twin deficit relationship and they argued that when budget deficit increases, the current account balance will deteriorate as the increases in the budget deficits will drive up domestic interest rates, real exchange rate and rate of capital inflows. Eisner (1989) also argued from the Keynesian point of view suggesting that increased aggregate demand enhances profitability of private investment thereby leading to a higher level of investment at any given rate of interest. Budget deficits are therefore viewed as a tool to stimulate aggregate saving and investment, despite the fact that they raise interest rates. Eisner assumes underemployment in the economy, thus increased consumption would be supplied by unutilized resources.

Also, on the other hand, there are other economic researchers who despite the theoretical appeal of the Keynesian view, do not broadly support it. These researchers employed the Ricardian Equivalence Hypothesis (REH) to argue that budget deficits result mainly from tax cuts which tend to reduce both public revenues and public savings.

The Ricardian Equivalence in an open economy will produce the same results as in a closed economy. In an open economy real interest is determined in the world capital markets and within the economy individuals are free to borrow and lend. Given that both public and private sector agents face the world interest rates Ricardian Equivalence is satisfied just like in the closed economy case. An increase in government debt is fully internalized by the private sector which accounts for the taxes to be paid back to lenders. In an open economy the private sector's savings rise by enough to avoid having to borrow from abroad (Barro, 1989).

2.3 Some Stylized Facts on the Twin Deficits in India.

The growth of Indian economy by nominal GDP is tenth-largest in the world and third largest by purchasing power parity (PPP). It is being forecasted by IMF that Indian economy would grow by 7.5 percent in the fiscal year 2015-16. In 1991 the current account deficit reached high levels of above 3 percent of GDP and fiscal deficit was the maximum in the two decades at 8.4 percent. Now again after close to twenty years the danger of twin deficits looms large over India. In India, the causation of the „Twin Deficits" could be that the fiscal deficit caused the current account deficit through the rising interest rates. The reverse causation could also be true with the high oil prices causing a current account deficit leading to fiscal deficit. The economy therefore provides a good study to test if the theory of the twin deficit on the direction of causality is valid for India or not.

Due to the ambiguous nature of study twin deficit theory and its practical implications for fiscal and trade policy making, the question of twin deficit in India has been the subject of a number of empirical studies. Kulkarni and Erickson (2001) use regression and Granger test to find a causal relationship stemming from India's budget deficit to its trade deficit over the period of 1979-1996. Along those same lines, parikh and Rao (2006) analysis over the three decades worth of Indian economy data to find that fiscal deficits contributes significantly to current account deficit.

On the other hand, a study by Anoruo and Ramchander (1998) of data five Asian developing countries (India, Indonesia, Korea, Malaysia and Philippines) find that trade deficit causes fiscal deficit. They observe that governments in developing countries may attempt to alleviate the economic consequences of large trade imbalance by engaging in fiscal stimulus programs, suggesting that trade imbalance spur fiscally oriented reactions.

Ratha (2012) finds that twin deficit theory hold true for India in the short-term, but not in the long run. Using monthly and quarterly data for the 1998-2009 periods, she finds evidence that by exercising Fiscal Discipline, Indian government should be able to mitigate the country's trade deficit in the short run. However in the long run, the importance of austerity measures as a trade deficit reduction tool becomes weak. Raju and Mukherjee (2010) use unit root test and co-integration to examine the relationship between the fiscal and current account deficit (both expressed in percentage of GDP) in india between 1980 and 2008, and they find no long-run relationship.

Suchismita Bose And Sudipta Jha (December.2011) "India's Twin Deficits: Some Fresh Empirical Evidence" examined the causal linkages between the government budget deficit and the current account deficit for India, within a multi-dimensional system with the exchange and interest rates acting as the interlinking variables. The study concludes that Bringing in oil prices helps complete the chain of reverse causation in the twin deficit hypothesis for India, as the direction of causation is unambiguously seen to run from oil prices to the external deficit to the fiscal deficit.

Anoru & Ramchander (1998) and Bose and Jha (2011) investigated the twin deficits hypothesis in Indian context. Jha tried to find out the existence of any such causal relationship between the two deficits within a multi-dimensional system with interest rate and exchange rate acting as interlinking variables. However, the results claimed that the causal linkage could be established

between fiscal deficit and interest rate and exchange rate. However, none of the variables statistically significantly cause the current account deficit. The direction of causality is seen to run unambiguously from oil prices to the current account deficit to fiscal deficit. Moreover, oil price is seen to cause significant influence in short run on all other variables in the system. Anorus and Ramchander (1998) analysed the twin deficits hypothesis of SEACEN countries including India using panel VAR framework covering the period 1957-1993. The results supported the presence of unidirectional reverse causality from CAD to fiscal deficit with inflation, interest rate and exchange rate playing the role of interlinking variables.

2.4 Theoretical Literature Review.

In empirical literature, two major theories are commonly used to explain the causal link between the budget deficit and the current account deficits. They include the Mundell-Fleming model of exchange rate regime and the Ricardian Equivalence Hypothesis approach.

2.4.1 Neoclassical View.

The standard neoclassical model has three main assumptions which are: consumers are rational, farsighted, and have access to perfect capital markets. This mean capital accumulation is being significantly dejected by permanent deficits, and other economic variables (including consumption, saving, and interest rates) have negligible effect by temporary deficits. If many consumers are either liquidity constrained, the impact of permanent deficits remains qualitatively unaffected. On the other side these temporary deficits should depress saving and raise interest rates in the short run.

2.4.2 Keynesian model.

According to simple Keynesian model where (S-I)+(T-G)=(X-M) an expansionary fiscal policy is indicated either in investment-saving gap or a deficit on the current account of the (BOP) balance of payment or both. According to Keynesian theory the increase in government expenditure or decrease in taxation primarily increase the level of income where by imports will be encouraged, which in turn leads to the deterioration of the current account deficit. The interest

rate may increase as a secondary effect as the result of the increase in the transaction demand of money and if the budget deficit is financed domestically. The increase in domestic rate can discourage private investments and durable consumption expenditure, there by crowding by out. This may cause the investment-saving gap.

Secondly the budget deficit is linked to the current account (trade) deficit if the government expenditure includes large component of imports. Thus government expenditure financed through debt directly affects the imports of economy. In this case the type of good that government imports is an important question to be considered. If the government imports the goods that do yield a return in the form of higher future tax returns, government may be able to repay the loans and interest however, if the imports are consumption goods such as food with no expected return, it will be difficult for the government to repay the loans and interest payments or the debt. Further the public debt/GDP ratio probably may increase and the fiscal position of the country may become unsustainable. The only option for the government to reduce its need to import consumption goods is to induce an increase in production and productivity in the economy.

Thirdly, the link between the budget deficit and trade deficit can be of the typical US case where the budget deficit is financed from foreign borrowing. The inflow of capital leads to an appreciation of the local currency, there by discouraging exports and encouraging imports and causing deficit or the trade balance. This form of twin deficit problem raises question such as whether or not higher budget deficit results in higher interest rates. Does an increase in interest rates leads to an appreciation of the local currency and does an increase in the exchange rate cause trade deficit?

Fourthly, causality may run from the trade deficit to the budget deficit. This may occur when the trade balance moves in the negative territory because of a fall in the demand for export or increase in imports due to the fall in domestic supply. Government may then decide to increase its expenditure to alleviate the problems caused by the fall in exports or to reduce taxes to induce an increase in domestic supply. In both cases the end result may be a budget deficit accompanied and caused by a trade deficit.

2.4.3 The Mundell-Fleming Model Framework.

This model was developed by the works of Robert Mundell (1968) and J. Marcus Fleming (1967) and it offers an exchange rate approach to analyzing how the budget and current account deficits are related. The model presupposes a small open economy with full international capital mobility with the assumption that interest rate is the same in the world economy, except in cases where capital controls exist (Olga, 2000). They emphasize that the causality exists between the two deficit and the causality moves from budget deficit to current account deficit. The model is often used by the conventional Keynesians to argue that an increase in the budget deficits would cause an increase in domestic absorption, increase aggregate demand and put upward pressure on domestic interest rate above the world rate. This in turn increases imports, reduce import and bring about an appreciation of the exchange rate thereby deteriorating the current account balance.

According to Fleegler (2006), when government acquire finance to pay deficit, it shifts upwards interest rate. Later the higher interest rate creates inflow of capital which increases the demand for currency which creates appreciation in domestic currency. This leads higher prices of good relatively foreign goods which in turn increase import and causes trade deficit (Fleegler, 2006). Onafowora et al (2006) also argued that in this framework, an increase in government deficit spending will cause an increase in aggregate demand and the domestic interest rate. If the domestic interest rate is higher than the world interest rate, there will be a net capital inflow from abroad and the domestic currency will appreciate. This results to a rise in imports, a fall in export and the deterioration of the current account balance.

Harshemzadeh and Wilson (2006) also posited that an increase in the fiscal deficit will lead to current account imbalance by driving up domestic interest rates, exchange rate and rate of capital inflows. Chang and Hsu (2009) equally argued that the increase in the budget deficit induces an upward pressure on interest rates which in turn leads inflows of funds from abroad and an appreciation of exchange rate ultimately leading to an increase in the current account deficit. Arize and Melinderos (2008) pointed out that even though the Mundell-Fleming suggests a unidirectional causality from budget deficit to current account deficit, there could be a reverse causality from the current account deficit to the budget deficit. If there is a change in inflation and leads to appreciation of currency which in turn decreases net exports and leads to trade deficit.

Chang and Hsu (2009) also provided another possible explanation reverse causality between the budget deficit and current account deficit by stating that this reversal could occur if deterioration in the current account balance leads to a slower pace of growth and hence an increase in the budget deficit.

Furthermore, Chang and Hsu (2009) posited that bidirectional causality could also exist between the twin deficits whereby the existence of significant feedbacks causes causality to run in both directions. To overcome with this problem necessary action are needed to supplement budget policies which will focus on export promotion, productivity improvement and exchange rate.

2.4.4 Ricardian Equivalence Hypothesis

The Ricardian Equivalence Hypothesis (REH) was introduced by Barro (1974) and its arguments arise from the Neo classical school of thought. The proposition states that the cuts in taxes are matched by an increase in savings since people look forward to the government increasing the taxes in future. This foresight gives rise to Say's Law for deficits that the demand for bonds always rises to match government borrowing. The proposition is expected to hold under the following conditions generational linkages, non-distortionary taxes, rational expectations (perfect foresight concerning the path of taxes and fiscal policies), identical planning horizons for both private and public sector agents, the availability of deficit financing as a fiscal instrument does not alter the political process and perfect capital markets with no borrowing constraint. The main assumption of the REH is that changes in budget deficit will have no effects on domestic interest rates, total savings, investment, price level and national income; thus not having effect on current account balance. The argument is that a reduction in taxes which is accompanied by an increase in budget deficit does not affect growth of consumption and hence, does not have any expansionary effect as households tend to increase savings in anticipation of higher taxes in the future which are necessary to redeem the debt. Critics of the Mundell-Fleming framework question the sequence of causation described by the model and thus employed the Ricardian equivalence hypothesis declares the absence of any association between budget deficit and current account deficit. These proponents argue that in a Ricardian world, it is believed that a budget deficit that is financed through a tax cut and bond sales would be perceived by individuals as incurring future tax liabilities to service and retire the increased debt. The

Ricardian Equivalence Hypothesis dispenses entirely with the income-expenditure approach and relied instead on the inter-temporal approach.

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Leachman (1996) and David Ricardo (1966) argued that there is no first order difference between tax and debt financed expenditure. The payment for public debt would be financed by future taxes, money creation and reduces government expenditure or additional deficits. Barro (1974) considered the effect of bond values and tax capitalization, finite lives, imperfect capital markets, government monopoly in the production of liquidity services and uncertainty about future tax obligations. The findings of the paper revealed that as long as there are intergenerational linkages there would be no net wealth effect and aggregate demand will not be affected.

Buchanan (1976) was the first person to point out the close relationship between Barro's proposition and the work of David Ricardo. Patinkin (1965) and Bailey (1971) also concurred on the idea that the means of funding government debt does not matter. Furthermore, Barro (1979) concluded again that the choice between debt and taxes does not really matter, however the study also sought to identify factors that influence the choice between debt and taxes. In a later paper, Barro (1989) cited major conjectural objections; that people do not live forever, and do not care about future taxes, private capital markets are not perfect, future taxes and income are not certain, taxes are not lump sum and the assumption of full employment. However, a number of observed findings tend to support Ricardian Equivalence. The study also notes that empirical analysis involves considerable problems with data and identification thereby rendering empirical literature to be inconclusive. This was also supported by Elmendorf and Mankiw (1999).

However, the ricardian equivalence theorem argues that either ways of financing the deficit (through reduced taxes or issuance of bonds), the present value wealth of private households is

not altered since both temporarily reduced taxes and issuance of bonds represents future tax liabilities (Hakro, 2009).

Berben and Brosens (2007) were interested in finding out whether the observed consumer reactions to fiscal policy could be explained by the level of government debt. A panel of 17 OECD countries was used and the ARDL approach to co-integration was applied. The results from the study pointed out that in the long run consumption is positively related to disposable household income, equity wealthy and housing wealth. Government debt has a statistically significant negative impact that is to say fiscal expansion is partly crowded out by a fall in private consumption. This implies Ricardian equivalence holds.

2.5 Methodological Review.

In examining the association between the budget deficit and the current account deficit, the most commonly used method employed in estimation is the co-integration approach, the Granger causality test, Vector Error Correction (VEC) model and the Vector Autoregressive (VAR) model (Chang and Hsu, 2009. The nature of this relationship is said to vary across countries and periods and different studies arrived at different conclusions as a results of difference in data set used and methodologies. Abbas et al (2010) identified three categories of methodologies broadly used to study the twin deficits relationship. To examine the relationship between outside variables and fiscal balance we use VAR causality test. The second step is to find out the long run relationship between variables we use co-integration. Finally we have to find the exogenous changes in fiscal deficit and we can apply regression analysis to study the impact.

Agarwal has analyzed the relationship between current account and budget account deficit of India (2014) for stationary of the variables using Augmented Dickey Fuller (ADF) test. Second, he tests co-integration of the variables using Johansen method. Then he further goes with the Vector Auto regression (VAR) methodology to estimate the relationship between the variables of interest. This model treats all variables on an equal footing, and there is no priori distinction between endogenous and exogenous variables. From the VAR model, he derives the Impulse Response Function (IRF). Finally they determine the Granger-causality directions.

Papia and Gholam (2014) have applying Augmented Dickey-Fuller (ADF) Test for the stationarity of the data, and then use the Vector Auto-regression (VAR) for optimal lag-length. He also used the Co-integration test to find out long run relationship between CAB and FB. They also uses error correction mechanism (ECM) because if the variables are co-integrated, then there must prevail (ECM). ECM is appropriate to find out the short run dynamics. To show the joint significance of lagged values of one variable to explain the variation in the other variable we use Wald test. Lastly to find out the causal relationship among the foresaid variables applying Granger-Causality test.

Succhismita and Sudipta (2011) examine the causal linkages between the two twin variables for India, within a multi-dimensional system with the exchange and interest rates acting as the interlinking variables. The study is done in a VAR/VECM framework, Unit root tests (ADF) and stationarity tests (KPSS) are performed, if there exists non-stationary, the system can be tested for co-integration. Johansen's multivariate co-integration tests are used to verify the existence of possible long-run relationship between the sets of variables considered in the study. If the variables are co-integrated according to the Granger there must also be an error correction model (ECM) that describes the short-run dynamics. They uses the block-exogeneity (block-Granger-causality-Wald) test, which looks at whether the lag of any variables Granger-cause any other variable in the VAR system, is used to test for the direction of causation between the variables.

Chang and Hsu (2009) provided broader evidence on the debate of causal linkage between the budget and current account deficits for five North European countries, four countries from Asia and the United States, concluding that most of the countries supported the twin deficit hypothesis but the strength varies across countries noting that none of the countries studied supported the REH.

Shukur and Hatemi (undated) tested the causality direction between the twin deficits in the US using the Rao's multivariate F-test combined with Bootstraps simulation technique which they argued has appealing properties. Afonso and Rault (2009) equally employed the Bootstrap panel Granger causality test to investigate existence of causality between current account balance and budget balance for different EU and OECD countries.

This study takes a look at a review of some of the methods used in some previous studies carried out on the twin deficit relationship. Arize and Melinderos (2008) employed the conventional fractional co-integration approach and the multivariate Wald test for Granger causality in testing

for dynamic linkages and causality between the budget and trade deficits for selected countries in Africa. Ganchev (2010) equally used VAR and VEC model in his analysis for Bulgaria and his results rejected the twin deficit hypothesis in the short run but indicated it might be valid in the long run.

Basu and Datta (2005) combine the fiscal deficits of the center and the states and study its relation with the trade deficit of the country. Since the data are of time series nature, we first focus on the stationary properties of the variables, both at levels and at percentage of GDP terms and applying unit root tests, and then apply the co-integration technique to investigate the relation between the two deficits, both at level and at percentage of GDP. Since our data is of seasonal in nature, they may have unit roots at long run, half-yearly and quarterly frequencies and accordingly they may be cointegrated at different frequencies. However, when the variables are found to have no seasonal root and unit root only at zero frequency, the maximum likelihood method of Johansen (1988) and Johansen and Juseiius (1990) can be applied. If, however the variables contain unit root other than annual frequency, Lee's (1992) extension of Johansen's method should be applied.

2.6 Empirical Review.

Njoroge et al., (2014) studied Kenya by using quarterly data spanning from 1970Q1-2012Q1 in a multivariate approach. This study employed the use of econometric tests including Johansen & Juselius cointergration tests, Vector Auto Regression and Toda- Yamamoto's Granger causality test. The study also estimated the Impulse response functions and Variance decomposition. The results indicate that the TDH does exist in Kenya in a multivariate environment as opposed to directly between budget deficits and current account deficits. The study discovered that there is not direct effect of government deficit on current account deficit. The effect is indirect through transmission from budget deficit to interest rate, from interest rate to exchange rate, and finally from exchange rate to current account deficit.

Mitra et al., (2014) analyses the twin deficits hypothesis in India covering the period April, 1994-95 to July, 2013-14. The paper starts with a descriptive statistics to check the presence of normality in the frequency distribution followed by unit root test of non-stationarity. The

presence of short run and long run relationship among the concerned variables, current account balance and fiscal balance has been tested by applying Cointegration Test followed by Error Correction Mechanism, Wald test and Granger-Causality Test. Finally, it ends with the estimation of growth rate of the variables over the period applying simple regression model. The empirical results prove the existence of long run relationship among FB and CAB. This relation was found to be positive, implying that a positive shock given to CAB affects FB positively, as is clear from the IRF result. However, the IRF result claims bi-directional causality among the variables. Any shock given to FB will positively affect the CAB. This result is also confirmed by the Wald test and Granger-Causality test. Moreover the growth rate of FB is higher than CAB though both the variables rise confirming the hypothesis.

Darrot (1988) investigates the causality between the budget deficit and the current account deficit in the US for the period 1960 to 1984. Darrot tested four hypotheses for the existence of relationship between the trade and budget deficit. The paper employed Granger-type multivariate causality tests. The result shows that a bi-directional link exists between the two deficits. That is not only does the budget deficit influences the current account but deteriorates the current account also may, induce the government to increase spending in support of domestic industries. Furthermore the author examines the casual relationship between the budget deficit and the current account deficit but also the casual role of a number of macro-economic variables in the budget and the trade deficit process. For example, growth of the money base granger cause the trade deficit, interest rate cause a trade deficit and foreign real income does nor granger cause the trade deficit.

Ebrahim Merza et al., (2012) examine the twin deficits hypothesis for Kuwait for the quarterly period (1993:4 - 2010:4). The paper tests the stationarity of the two variables, estimates the cointegration regression (the Johansen cointegration test), applies the VAR model, estimates the IRF, and tests for existence and the direction of causality. This paper confirms the existence of the long-run equilibrium relationship between budget balance and current account. This relationship was found negative that is BB responds negatively to a shock in CA. In other words, an improvement in the current account position (usually driven by the increase in the surplus of the trade balance) will cause budget balance surplus to decrease or its deficit to increase. This explains why the effect comes from CA to BB (the result of the causality test). The other

direction (that comes only from budget balance and current account) was not proven. These results prove that the twin deficit hypothesis (as presented by the theoretical model) was not confirmed for the Kuwaiti economy over the time period of our analysis. This finding fits the Kuwaiti economy; since an improvement in the current account driven primarily by the improvement in the trade balance will cause the central government to spend more than it receive in revenue causing a decrease in government budget surplus or an increase in government budget deficit.

Sobrino (2013) examines causation between the current account and the fiscal surplus and fiscal spending for a commodity-based economy, Peru by using quarterly data for the open economy from 1980:1 to 2012:1. The study employed Unit root tests ADF, Augmented Dickey-Fuller; Phillips-Perron, Granger causality–wald test Generalized forecast error variance decomposition and generalized impulses-response function. The evidence rejects TDH in its place, the evidence accepted reverse causality. The results are not sensitive for a specific regime. Likewise, variance decomposition and the impulse responses function, outcomes support the reverse causality. In the short run, the fiscal policy does not alter the current account, but improvements in current account increase the probability of attaining the lower bounded fiscal deficit. The reverse causality is consistent with a small open commodity-based economy highly exposed and sensitive to external price shocks. In this case, the diversification of sources of national income should alter this causality.

Osoro et al., (2014) the paper test the twin deficit hypothesis and empirical relationship between current account balance and budget deficit while including other important macroeconomic variables such as growth, interest rates, money supply (M3) in Kenya from 1963-2012. The study was based on co integration analysis and error correction model (ECM). The results showed a positive and significant relationship between budget deficit and current account. The signs of the normalized co integrating coefficients suggest that there is also a positive relationship between current account deficit and interest rates, GDP and negatively related to money supply. In other words, current account deficit tends to increase along with the increase in fiscal deficit, GDP, interest rates and decrease with money supply in the long run. This means, a rise in budget deficit would be followed by an increase in external balance. We find the causal

relationship works through two channels: first is the direct causal link from budget deficit to current account deficit, and the second is the indirect channel that runs from budget deficit to higher interest rate; which lead to appreciation of the currency, in turn worsening the current account deficit.

Khalil Mudasir et al., (2013) investigate the relationship between budget deficit and trade deficit commonly known as 'twin deficits hypothesis in Pakistan economy. They used time series data for the period of 1980 to 2011. The empirical analysis pertain ARDL co-integration methodology and indicate dynamic analysis for the long run and short run. The Error Correction specification is used to find evidence of long-run causality running from budget deficit to trade deficit. The study checks the hypotheses that trade deficit is the determinant of budget deficit. The ARDL results of the short run confirm the hypothesis that trade deficit can determine the budget deficit in the case of Pakistan. The results of the long run estimates are also significant. The ECM results are also significant with its required negative sign but the coefficient of ECM is small. The results of the Granger causality also confirms that there exist the bidirectional causality between these two variables this shows the budget deficit and trade deficit cause to each other.

Osama El-Baz (2014) tested the validity of the Twin Deficits Hypothesis (TDH) in Egypt, using annual time series data for the period (1990-2012). By employing ADF unit root test, Johansen Cointegration test, Granger Causality test and Vector Error Correction Model (VECM). The evidence of a twin divergence was found in the short run between current account and government budget balances. Also, a long-run negative equilibrium relationship was found between current account deficit and the budget deficit. The Granger causality test rejects proved a reverse causal relationship running from the current account deficit to the budget deficit. A "twin divergence" was found to exist between the two deficits in the short run, also the Vector Error Correction Model (VECM) proved the existence of a negative long run equilibrium relationship between both current account and government budget balances, with a relatively high speed of adjustment toward the equilibrium position.

Darrot (2002) revisit the relationship between government budget deficit and interest rate in Greece. Findings of this paper was that budget deficit in Greece have no significant effect on

interest rate. No compelling evidence to support the Keynesian claim that large budget deficit in Greece led to rising interest rate. Sample time period is (1950-1993) and used single equation type model in which interest rates on one year Treasury bill are assumed to be a function of seven explanatory variables i.e. real GDP, unemployment, inflation rate, real budget deficit, real M1, real government expenditure and real government transfer. These findings derived from system estimation granger representation theorem and estimate an error-correction model (ECM) and sensitivity tests.

Robson Mandishekwa et al., (2014) studied Zimbabwe from 1980 2011; the analysis of the study is done by unit root test, Granger Causality test, Johansen Cointegration test, representation alongside variance decomposition. The cointegration test shows that there exists a long-run relationship between budget deficit and current account deficit. Again this can be interpreted as evidence of the twin deficits hypothesis. Thus, using the cointegration approach, we can conclude that the twin deficits hypothesis exists in Zimbabwe. The results of the research presented here indicate that while there is cointegration, meaning evidence of twin deficits, this is only confirmed by a Granger causality running from budget deficit to current account deficit as shown by lag two results. This unidirectional causality means twin deficits hypothesis hold. However, there is no causality between the two deficits according to other lags, thus implying absence of twin deficits. We can therefore conclude that the results are mixed. This means that an increase in budget deficit will lead to a current account deficit.

Abdulnaseer Hatemi et al., tested the causality direction between Twin deficits in the US based quarterly basis from the period 1975Q1-1998Q2. By using vector autoregressive (VAR), Granger-causality test by using the multivariate Rao's F-test and Bootstrap testing procedure. the results of the Bootstrap test, and Rao's F test for causality that are applied to the VAR model for the quarterly data of CAD and BD in the US indicate that these two variables does not Granger cause each other. When splitting the sample into two sub periods, however, the results show that only BD Granger causes CAD in the first sub-period, while the opposite is right when considering the second sub-period. This means that, during the second sub-period, the causality nexus between these two variables has a one-directional form in the opposite direction from the first sub-period. The policy implication of this result is that reducing current account deficits will

result in decreasing budget deficits in the US economy. In addition the results show that the effects of structural breaks are of paramount importance when the causality tests are conducted.

Suparna Basu et al., (2005) undertake an econometric exercise to study the impact of the fiscal deficit on India's external accounts since the mid-1980s. The fiscal deficit and trade deficit - both at levels as well as at percentages of GDP - are not found to be twins in Indian economy during the period of our study. Thus, changes in fiscal deficit have not caused any systemic corresponding changes in trade deficit find that even though savings income ratio has increased side by side with fiscal deficit, there is no long-run relation between savings ratio and fiscal deficit - GDP ratio. This implies that Indian economic agents have not increased their savings in response to higher fiscal deficit and thus REH is negated in the Indian circumstances and finds an absence of cointegration between the two deficits. Further, an absence of cointegration between the savings rate and the fiscal deficit-GDP ratio also negates the REH in Indian circumstances.

Mosayeb Pahlavani et al., (2009) examine the relationship between the budget deficit and current account deficits in the Philippines using time series data for the period of 1970-2005. They utilized Toda and Yamamoto's procedure in order to determine the direction of causality between budget deficits and current account deficits. The results support the Keynesian view that there is a strong link between budget deficits and current account deficits in the Philippines. The results of Toda and Yamamoto's causality analysis supported the existence of bidirectional causality between budget deficits and current account deficits in this country. Bi-directional causality between budget deficits and current account deficits was found. This finding was plausible, given the economic crisis in the early 1980s which was associated with economic driven foreign debt in the Marcos era.

Kanchev (2010) studied Bulgarian economy brings into question the validity of the twin deficit hypothesis. The Granger causality tests confirm that fiscal deficit has a significant impact on current account deficit, as postulated by the twin deficit hypothesis and the New Cambridge School. In the short run, however, the results of VAR analysis show that higher fiscal surpluses

are associated with higher current account deficits, which is contrary to the twin deficit hypothesis. In the long run, according to the results of a VEC model, fiscal deficits seem to lead to additional private sector and current account deficits. This is possible only when foreign saving actively affects the domestic economy, facilitating the financing of both public and private sector deficits. This result supports the so-called structural gap hypothesis on internal and external equilibrium. The VEC analysis allows us to reject the strong form of the twin deficit hypothesis as well as the Ricardian equivalence view for the Bulgarian data. But in the long run we can expect some positive correlation between fiscal and current account deficits, as postulated by the twin deficit hypothesis. The finding that the twin deficit hypothesis in its hard form (the equality between current account deficits and fiscal surpluses) does not hold in the specific case of Bulgaria has several implications for economic policy.

Giancarlo Carsetti et al., (2008) consider quarterly time series data of ten OECD countries covering the post-Bretton Woods period 1973-2005 and reconsider the notion of twin deficits in light of empirical evidence from a sample of ten OECD countries and quantitative results from a standard international business cycle model. The negative correlation found in the data is not inconsistent with the twin deficit hypothesis our results suggest that, conditional on fiscal shocks, the budget and the trade balance co-move strongly, although their overall correlation is determined by other shocks driving the business cycle. The model predicts a strong positive correlation between trade and budget balance, conditional on government spending shocks, but this does not necessarily imply a strong economic effect of fiscal shocks on the trade balance. Even if conditional on fiscal shocks the correlation between the two deficits is positive and strong, the quantitative response of the trade balance may still be quite contained, especially in economies with a low import share in GDP.

Thepthida Sopraseuth (1999) focused on the twin deficit hypothesis did not reach any consensus. In this paper isolates two reasons for these conflicting conclusions, as mentioned by Rosenweig and Tallman (1993), considering data in levels versus stationarized series does have an impact on the results. While data in levels tend to lend support to the twin deficit behavior, stationarized data do not give evidence of any positive link between net exports and government balance. The attempts to re-examine the relationship between trade and fiscal deficits by emphasizing the

mechanism presented in Baxter (1995), paper the correlation between trade and fiscal deficits is sensitive to the nature of the dominant shock in the US economy. When technological shocks are more volatile than government spending shocks, the US net exports and the budget balance move in opposite directions. In contrast, the twin deficit appears because of dominant government shocks. Johansen and Juselius procedure confirms the intuition that the long run behavior of the US data endorses the twin deficit view both tests point at a unique cointegration relation Net exports are indeed positively linked to government deficit in the long run, which gives some evidence of the twin deficit behavior.

Anjum Aqueel et al., (2001) study covers the period from 1973-98 for Pakistan. The data for fiscal deficit (FD), GDP deflator (GD), Consumer Price Index (CPI), Average Exchange Rate (EX), money supply (MM), current account balance (CA) and GNP at constant price. They employed Phillips-Perron (PP) unit root test, Johansen cointegration test, ECM and trace test. In Pakistan that budget deficit has powerful long run effects on current account deficit, as evident from statistically significant in all equations of the model. On The other hand fiscal deficit equation reflecting long run effect of current account deficit on fiscal deficit is positive and only significant in model 1 and also reflects there is no evidence of short run causality from current account balance to fiscal deficit. ECM estimates suggest a change in FD over change in CAB in the long run in all of the models. The paper did not find any relationship between the twin deficits through the interest rate linkage and found no cointegration between interest rate and the twin deficits.

Walter Enders et al., (1990) used quarterly data of U.S over the sample period of 1947Q3 to 1987Q1. They develops a two-country micro-theoretic model consistent with the Ricardian equivalence hypothesis (REH), the theoretical model implies a set of restrictions for certain groups of variables in the VAR system. Imposing these constraints on the data does not allow us to reject the model at conventional significance levels the data are consistent with the REH. Specifically, tax increases used to retire government debt will not affect private spending or the current account balance. However, increases in government spending, regardless of the means of finance, can be expected to induce a current account deficit. Due to some limitations in rigorous

testing of the model does not allows us to reject the independence of federal government deficit and current account deficit.

Ashok Parikh et al., (2006) paper examines the effects of fiscal deficits on the current account deficits in the Indian economy. They analyzed the twin deficits problem of India using the cointegration and error correction framework. He finds that causation runs from domestic to external deficits, and that there are well determined long- and short-run relationships between the ratios of current account deficits to GDP, investment to GDP and fiscal deficits to GDP. In addition, the real exchange rate is found to be an important determinant of CAD. The study finds that devaluations are no panacea to cure balance of payments problem in India. Since reductions in the growth inducing investment are not a policy option, an alternative is reductions in the domestic budget deficits. This view is tested here using the cointegration and error correction models, and we have found that fiscal deficits turn out to be a significant explanatory variable of the long- and short-run variation in CAD. If the adverse effects of devaluations on domestic deficits are recognized, it can be said that reductions in the domestic budget deficits are a more effective option to correct India's balance of payments problems.

Mohammadi (2000) primary goal of this paper was to investigate the empirical validity of the conventional and the Ricardian view regarding the potential impact of budget deficit on the foreign trade balances. According to the conventional view given the path of government expenditure, substitution of budget deficit for current taxes increase the foreign trade deficit. In contrast the Ricardian view suggests that the higher budget deficit is offset by an equal increase in the desired private saving. Thus he trade balance remains unaffected. This study uses cross sectional data for the sample of 67 countries which is constructed using annual data covering the period 1975-95. The estimate generally indicates a positive and significant long run link between government budget surplus and trade balance. Thus the data seems to strongly support the neoclassical prediction. The finding suggests the reducing the budget deficit by one percent of GDP may improve the trade balance by close to 0.50 percent of GDP. Thus the cross country findings are broadly consistent with previous individual country results obtained from alternative empirical model and different time series data sets.

Parikh and Rao (2006) there findings were that causation in India seems to run from FDP to CAD. Results shows well determined long run relationship between CAD and FDP in India. Data used in this paper were on the basis of fiscal year. i.e. April march from 1970-71 to 1999-2000 where data were for the calendar year it was rendered to fiscal year by using weighted average with weights of 0.75 and 0.75 applied to two consecutive year. Trade balance and current account balance are expressed as ratio of GDP. Real exchange rate is with 36 country weights and it is in the index number form. Analyses of data have been done by using the cointegration and error correction framework. They found causation run from domestic to external deficit and there will determine long and short run relationship between the ratios of current account deficit to GDP and fiscal deficit to GDP. In addition real ER is found to be important determinant of current account deficit.

An important finding of the study is that devaluation is no panacea to cure balance of payment problem in India. Since reduction in the growth inducing investments are not policy options alternative is reducing in the domestic budget deficit. India's economy BOP is different from American situation. India borrows from external sources leading to higher interest on the invisible accounts and predicating currency crises. This view was tested by using cointegration and error correction modal and found that the fiscal deficit turn out to be a signification explanatory variable of long run and short run variation in current account deficit. If the adverse effect of devaluation on domestic deficit is recognized it can say that reduction in domestic budget are more effective option to correct Indian BOP problem.

Lau and Baharumshah (2004) discuss the issue of twin deficit in Malaysia (developing countries), Malaysia and other crises affected Asian counties have large twin deficit. Data utilized for this paper is range from 1975-2000 and it is time series data. The prime motive of this paper is investigation of casual link between budget deficit and trade deficit. The technique utilized in this paper is Granger non causality test for long run relationship between two deficits and ECM is also employed. Bi-directional causality between budget deficit and trade deficit is found and it is not surprising for countries like Malaysia. Causal relationship was transmitted through interest rate and exchange rate from budget to trade deficit. But this study was not generalized for other developing countries.

Zietz and Pemberton (1990) investigated the role of BD and income growth abroad for explaining the US trade deficit (TD). The analysis employs a structural simultaneous equation framework. The model of three structural equations is estimated on quarterly seasonally adjusted data for period 1972:4 to 1987:2. This theoretical model allows for three transmission channels between the BD and CA. The first channel operates directly via the bond market and exchange rate. Channels two and three both rely for their initial impact on a positive relationship between BD and increase in domestic adsorption. Using policy simulation the authors concluded that the BD was transmitted to the trade balance primarily through the impact on imports of rising domestic absorption and income rather than of rising interest and real exchange rates. Authors found that higher foreign income can play limited role in lowering the US trade deficit, especially taking into account the fact that foreign income growth also implies a rising real exchange rate. Moreover, perceptible increase in foreign income and a very substantial cut in the BD did not manage to cut the TD even in half by 1987.

Darrat (1988) investigates empirically causality between BD and CAD in the USA for the period from 1960:1 to 1984:4. Taking into account complexity of the relationship between the two deficits the author test four hypotheses: 1) BD causes TD; 2) TD causes BD; 3) the two variables are causally independent; 4) the two variables are mutually causal. Such an approach is justified by the fact that not only BD influences CA but also deterioration in the CA may induce the government to increase spending on support of domestic industries. The paper employs Grander-type multivariate causality tests combined with Akaike's final prediction error criterion. The result shows that bi-directional link exists between the two deficits, so the 4) hypothesis is supported. The author examines not only causal relationship between BD and CAD but also causal role of a number of other macro variables in the budget and trade deficit process. For example, growth of money base that could approximate aggregate demand Granger- causes TD; interest rates cause TD; foreign real income does not Granger causes TD. Such variables as short term interest rate, wage cost, monetary base, real output, foreign real income, inflation, exchange rate, long term interest rate were included in the BD equation and were influenced the behavior of fiscal authorities.