

International Journal of Advance Research in Computer Science and Management Studies

Research Paper

Available online at: www.ijarcsms.com

A Cointegration and VECM Approach in Explaining Relationship of FDI with Current and Capital Account of India

Dr. Manminder Singh Saluja¹Assistant Professor (Senior Scale),
International Institute of Professional Studies,
DAVV,
Indore – India**Navneet Kaur Bhatia²**Assistant Professor
International Institute of Professional Studies,
DAVV,
Indore – India**Nishant Patel³**Student MBA (MS) 5Yrs,
International Institute of Professional Studies,
DAVV,
Indore – India

Abstract: The Subprime crisis of 2007-08 led many countries of the world to fall into a recessionary period. This resulted in many countries facing different macroeconomic problems. In present scenario the Indian economy is also facing many macroeconomic problems one to the likes of current account deficit. The govt. in recent times is trying hard to boost FDI to finance the deficit. In this paper, we have tried to investigate the relationship between foreign direct investments (FDI) & the current account (CU) and foreign direct investments (FDI) and capital account (CA) in context of Indian economy. Using the Augmented Dickey Fuller Test, it was found that all the series is non stationary at level. The Johanson Cointegration test was used for finding relationships between variables for the period of 1991Q1-2012Q4. Our result indicates that FDI - CU and FDI - CA are cointegrated in the long run. Results suggested that the current account balance has a negative relationship to FDI but capital account made a positive impact on FDI after the liberalization of the economy.

Keywords: FDI, Current Account, Capital Account, Cointegration, VECM, India JEL Classification: C58, F32.

I. INTRODUCTION

Presently the balance of payment of every country matters for accelerating the growth engine of the economy especially for the developing countries. Every country has a different condition of its balance of payment; it may be deficit or surplus. Balance of payment is the collection of import and export of goods, services and funds. It contains three components Capital Account, Current Account and Reserves. The current account is the collection of balance of import and export of goods & services, and capital account for the balance of funds. Foreign Direct Investment (FDI) inflow is a signal of investment friendly and developing economy, in which growth rate is higher than other economies of the world.

The Balance of Payment of the major developed countries shows surplus balance which means that their exports are more than their imports as is the case of the EU and Japan, and developing nations probably have a deficit balance like India, Russia, Brazil etc. but some developing country like China has surplus every time. The FDI is the major driver of growth route for the development in the developing countries. The needs of the developing nations could not be met through internal resources and they have to import goods and services from foreign countries. This creates the surplus or deficit balance condition in the balance of payment of the countries. In case of increase in imports over and above the exports, countries require more of the US dollars (USD) for payments to other countries, for the fulfillment of these USD requirement countries loosen their norms for

inward foreign investment and open the economy for the foreign investors to invest more fund in the form of USD and this is termed as Foreign Direct Investment (FDI). It helps in the payments of the deficit balance of the current account and creates more reserve balance for future payment obligations.

The Indian economy was a closed economy till 1991 with the continuous deficit balances in the Balance of Payments statement. During the 1991 crisis, the Indian government made reforms in its foreign investment policies and ensured more inflow of foreign investment by opening up different sectors for foreign investors in a phased manner. Due to these economic policy changes, India received more foreign fund through the FDI route which played an important role in its economic development. Till the 2008 crisis, Indian economy has witnessed a growth period in various sectors of the economy. Most of the economies around the world are facing liquidity crunches due to the 2008 crisis and are trying to control their imports. India too has been hit by this crisis and the BOP condition has worsened. To accelerate the economic growth, India took many steps to promote international trade especially exports, but is unable to control the Current Account Deficit (CAD). The major reason behind the CAD is our excessive import of goods like Petroleum, Gold, Coal etc. and the increasing imbalance between the figures of Indian exports and imports.

In the present study we investigate the relationship between the FDI, current account and capital account. The purpose is to explore, if any relationship exists between FDI, current account and capital account or any directional casual relationship between them and what affects the variables in the long run relationship.

II. REVIEW OF LITERATURE

Foreign capital flows may affect the macroeconomic strength of the host countries. Most developing countries face the problem of insufficient capital within the country and hence need the inflow of foreign capital (Majeed and Ahmed, 2013). The literature on the relationship between FDI and Balance of payment is very thin, but furthermore research upon the relationship between FDI, Current account & Capital account in developing nations is limited. The relationship of FDI with different factors of economic development has been studied in different research studies; the relationship of FDI with the Gross Domestic Product (Al-Habees and Khasawneh, 2011), and other factors such as economic growth, domestic absorption and exports (Majeed and Ahmed, 2013).

Many studies on FDI have explored its nexus with the exports; Klasra (2009), Majeed and Ahmed (2013), Athukorala and Menon (1996) explain the role of FDI in export expansion and employment generation, Samsu et al (2008) investigated the causal relationship between FDI inflows and exports in Malaysia.

The literature on FDI, trade and economic growth generally suggests a positive relationship between Trade and FDI-Growth Jayachandran and Seilan (2010). There is also evidence of the negative impact of FDI on the Balance of Payments Dhanani & Hasnain (2002) and it contributed to the persistent deficit in manufacturing goods due to its larger propensity to import production inputs from abroad.

Few studies have investigated the impact of FDI on the Current account balances; Jaffri *et. al.* (2012) investigated the impact of foreign direct investment (FDI) inflows on current account balance excluding current transfers (CABECT), and income outflows (IO) of balance of payments (BOP), Ranjan and Nachane (2004) studied the changes in the Capital account of India, Froot (1991) explains the increase of FDI in Japan connecting it with Japanese current account surplus, actual or anticipated protectionism abroad, appreciated stock prices and the value of the Yen and changes in International tax policy.

There is a lack of systematic studies on the relationship of FDI with Current account and Capital account of the BOP. The present study is an attempt to fill this gap and provide new insights on the subject matter.

III. OBJECTIVES

The objectives of the study are as follows:-

- ✚ To test for stationarity of data for Current Account, Capital Account and FDI.
- ✚ To investigate the relationship between Foreign Direct Investment and Current Account (CA) in India and find out any long term relationship between them.

The study moves in the direction as section I, II and III introduces the topic, studies literature review and states the objectives of the study respectively, section IV deals with the data & research methodology. Section V states the results and discussions of the study. Finally, section VI concludes the research.

IV. DATA SOURCES AND RESEARCH METHODOLOGY

The study was done taking three variables into consideration i.e. Current Account (CU), Capital Account (CA) and FDI. These variables were studied using quarterly data from first financial quarter of 1991 to last financial quarter of 2012. The data is of secondary nature collected from the database of Reserve Bank of India. The data were studied using the below mentioned methods.

A. Augmented Dickey & Fuller (ADF) Unit Root Test

The Augmented Dickey-Fuller (ADF) test was used for testing the stationarity of data. This is the basic test for checking the unit root in the series. There are three types of different conditions in the ADF test which could be applied to any time series. First, random process includes no intercept (c) and trend (t). Second, random process includes intercept (c) but no trend (t). Third, random process includes intercept (c) and trend (t). It was found that first condition will be most suitable for the data series in this study. Following is the ADF equation for studying the problem of stationarity in the data -

$$\Delta Y_t = \mathbf{B}_1 + \mathbf{Z}Y_{t-1} + \hat{\alpha}_1 + \epsilon_t$$

B. Johanson Cointegration Test

To identify whether all the variables that are included in the system are cointegrated or not, we used Johanson Cointegration test. Johansen's (1988) and Johansen and Juselius (1990) procedure is the most widely used approach in the research which is based on 'Maximum Likelihood method' and 'Eigen Value Statistics' to confirm the existence of the long run relationship among all tested variables. Cointegration is said to exist if the values of computing statistics are significantly different from zero. Thus, variables if found to be cointegrated, implies that there exist a linear, stable and long-run relationship among variables, such that the disequilibrium errors would tend to fluctuate around zero mean. This means that variables tend to move together in its steady state path in the long run. The first condition, needed to ensure that the data are not I(0) as discussed earlier, is that π has reduced rank $r < p$, so can be written as:

$$\pi = -\alpha\beta'$$

Where α and β are $p \times r$ matrices, both of rank r .

C. Vector Error Correction Model

The purpose of the VECM is to focus on the short run dynamics while making them consistent with long run solution. If a number of variables are found to be cointegrated with at least one cointegrating vector, then there always exists a corresponding error-correction representation which implies that changes in the dependent variable can be formulated as a function of the level disequilibrium in the cointegration relationship and fluctuation in other explanatory variables.

V. RESULTS AND DISCUSSION

Non Stationarity is a common feature of almost all the economic time series. It is therefore important for the research to test for stationarity before generalizing any relationship. The research used the Augmented Dickey Fuller (ADF) Test to check for stationarity.

TABLE- 1
ADF Test of Variables at Level (5%)

| Variables | None | | |
|-----------|-------------|----------------|-------------|
| | t-statistic | Critical value | probability |
| CU | -0.7246 | -1.9447 | 0.3998 |
| FDI | 1.7309 | -1.9447 | 0.9792 |
| CA | 0.4207 | -1.9446 | 0.8021 |

TABLE- 2
ADF Test of Variables at 1st Difference (5%)

| Variables | None | | |
|-----------|-------------|----------------|-------------|
| | t-statistic | Critical value | probability |
| CU | -2.1901 | -1.9447 | 0.0099 |
| FDI | -8.2507 | -1.9447 | 0.0000 |
| CA | -11.9031 | -1.9446 | 0.0006 |

It is clear from table 1 that all the three series i.e. Current Account (CU), Foreign Direct Investment (FDI), and Capital Account (CA) are non stationary. All the three time series FDI, CU and CA tends to become stationary at I(1) (Table- 2). It is empirically observed that non stationary time series had a tendency to correlate in the long term. This long term relationship could be better understood by applying the Johanson Cointegration test.

TABLE- 3
Johanson Cointegration Test for FDI-CU

| Test | Hypothesized No. of CE(s) | Eigen value | Trace/ Max-Eigen Statistic | 0.05 Critical Value | Prob.** |
|---|---------------------------|-------------|----------------------------|---------------------|---------|
| Unrestricted Cointegration Rank Test (Trace) | None * | 0.229563 | 23.76789 | 15.4947 | 0.0023 |
| | At most 1 | 0.015453 | 1.339321 | 3.84146 | 0.2472 |
| Unrestricted Cointegration Rank Test (Maximum Eigenvalue) | None * | 0.229563 | 22.42857 | 14.2646 | 0.0021 |
| | At most 1 | 0.015453 | 1.339321 | 3.84146 | 0.2472 |

Trace and Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

The above table suggests that the null hypothesis of no Cointegration is rejected stating that there exist one Cointegration vector among the variables. The vector is analysed using VECM on these variables to get the equation. The Cointegration equation that was estimated can be represented as

$$FDI_{t-1} - 4983.804 + 0.547904CU_{t-1} = 0, \text{ which can rewrite as } FDI_{t-1} = 4983.804 - 0.547904 CU_{t-1}.$$

The above equation clearly states an inverse relationship between current account balance and FDI. These results had a strong theoretical support, but the positive surprise is that it had a marginal propensity of more than 50% for India. However the short run disequilibrium that exists between these variables is -0.092548 which gets cleared in the next time period.

Capital Account is the other major component of the country's Balance of Payment. There are a number of ways through which capital enters or leaves the economy. These items constitute the credit and debit side of BOP. Among the listed components in the capital account, FDI is considered as the primary and the most important item. This factor had a strong and

direct bearing on the growth and development of the economy. The People's Republic of China is the best global example of the theory. India had also opened up its capital account in a phased manner to encourage the inflow of FDI into the country.

It is clearly evident from the data that there had been a quantum jump in FDI inflow into the country after the reform that were initiated in July 1991. The FDI inflows in India during mid-1948 were Rs 2.56 billion. It almost doubled in March 1964 and increased further to Rs. 9.16 billion. The country received a cumulative FDI inflow of Rs.17819.64 billion during August 1991 to March 2010 as compared to Rs. 53.84 billion during mid-1948 to March 1990.

An annual FDI inflow indicates that FDI went up from around negligible amounts in 1991-92 to around Rs 4555.82 billion in 2005-06. It then hiked to around Rs 1342.82 billion in 2006-07, rising to around Rs 2418 billion by 2011-12. It is clearly evident that the data reflect the presence of the long run relationship between FDI and Capital Account of India.

TABLE-4
Johanson Cointegration Test for FDI-CA

| Test | Hypothesized No. of CE(s) | Eigen value | Trace/ Max-Eigen Statistic | 0.05 Critical Value | Prob.** |
|---|---------------------------|-------------|----------------------------|---------------------|---------|
| Unrestricted Cointegration Rank Test (Trace) | None * | 0.254285 | 27.02812 | 15.49471 | 0.0006 |
| | At most 1 | 0.024266 | 2.088068 | 3.841466 | 0.1485 |
| Unrestricted Cointegration Rank Test (Maximum Eigenvalue) | None * | 0.254285 | 24.94005 | 14.26460 | 0.0007 |
| | At most 1 | 0.024266 | 2.088068 | 3.841466 | 0.1485 |

Trace and Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Johanson Cointegration test performed in the above table states a presence of one cointegrating vector in the system. This is evident in the light of P values for both the test. The P values are less than 0.05 in trace as well as in the Max - Eigen test. The existence of one vector in the equation highlights that both the variables i.e. FDI and CA had a long run equilibrium value of 0.530781. The results highlight a strong correlation to exist between FDI inflow and CA. A positive balance in the capital account provokes more of FDI to enter the Indian economy. Although it is sure that conducive business environment along with market friendly policy in the country provides strength to the capital account.

$$FDI_{t-1} + 1888.364 - 0.530781CA_{t-1} = 0, \text{ which can rewrite as } FDI_{t-1} = -1888.364 + 0.530781CA_{t-1}.$$

The speed of adjustment of the system stated a correction of short run disequilibrium if CA is positive in the form of rising FDI in the next quarter by 0.143571 units towards the equilibrium level.

The findings of the study are in sharp contradiction to Manpreet Kaur *et. al.* (2012) and Sarode (2011). Manpreet Kaur had stated only the existence of unidirectional causality from FDI to Current Account while Sarode found that FDI has negative impact on CU but positive on CA.

VI. CONCLUSION

In this paper, we have econometrically analyzed and examined the causal relationship between FDI & Current Account and FDI & Capital Account. We used Johanson cointegration method to find the relationship between the variables. The investigation of this relationship is crucial for Indian economy in present scenario, where the current account deficit is one of the major macroeconomic problems which is affecting the growth of the economy and for that government had tried to finance the deficit with the help of the FDI inflows. At the same time, there have been consistent efforts to attract the foreign investors to stabilize the investment environment in India.

References

1. Majeed and Eatnaz Ahmad (2008), "FDI and Exports in Developing Countries: Theory and Evidence", *Pakistan Society of Development Economists Islamabad*, March, pp. 735-750.

2. Al-Habees, Mahmood Abdallah; Sami Nizar Khasawneh (2011), "The Relationship between the Foreign Direct Investment and the Gross Domestic Product in Jordan", *Journal of Advanced Social Research*, pp. 89-99.
3. Klasra, Mushtaq Ahmad, (2009), "Foreign Direct Investment, Trade Openness and Economic Growth in Pakistan and Turkey: An Investigation Using Bounds Test", *Quality & Quantity*, Volume 45, Issue 1, pp 223-231.
4. Athukorala, Jayant Menon (1996), "Foreign Investment and Industrialization in Malaysia: Exports, Employment and Spillovers", *Asian Economic Journal*, Vol. 10 No I, pp. 29-44.
5. Samsu, S. H., A.M. Derus, and A. Ooi. (2008), "Causal Links Between Foreign Direct Investment and Exports: Evidence From Malaysia", *International Journal of Business and Management* 3, pp: 177-183.
6. Jayachandran, G. and A. Seilan (2010), "A Causal Relationship between Trade, Foreign Direct Investment and Economic Growth for India", *International Research Journal of Finance and Economics*, Issue 42, pp. 74-88.
7. Dhanani & Syed Asif Hasnain (2002), "The Impact of Foreign Direct Investment on Indonesia's Manufacturing Sector", *Journal of the Asia Pacific Economy*, Volume 7, Issue 1, pp 61-94.
8. Jaffri, Nabila Asghar, Mahnaz M. Ali and Rooma Asjed (2012), "Foreign Direct Investment and Current Account Balance of Pakistan", *Pakistan Economic and Social Review*, Volume 50, No. 2, pp. 207-222.
9. Ranjan and D. M. Nachane (2004), "Analysis of the Capital Account in India's Balance of Payments", *Economic and Political Weekly*, Vol. 39, No. 27, July 3, pp. 3031-3044.
10. Froot, Kenneth A. (1991), "Japanese Foreign Direct investment", *National Bureau of Economic Research*, June, pp: 1-49.
11. Kaur, Manpreet, Surendra S. Yadav, and Vinayshil Gautam (2012), "Foreign Direct Investment and Current Account Deficit- a Causality Analysis in Context of India", *Journal of International Business and Economy*, pp. 85-106.
12. Sarode, Sushant (2011). "Effects of FDI on Capital Account and GDP: Empirical Evidence from India", *International Journal of Business and Management*, Vol. 7, No. 8; pp. 102-107.
13. Buch, Alexander Lipponer (2007), "FDI versus Exports: Evidence from German banks", *Journal of Banking & Finance* 31 pp: 805-826.
14. Zenegnaw, Abiy Hailu (2010), "Impact of Foreign Direct Investment on Trade of African Countries", *International Journal of Economics and Finance*, pp: 122-133.

AUTHOR(S) PROFILE



Dr. Manminder Singh Saluja, is a University Assistant Professor at International Institute of Professional Studies, Devi Ahilya University. He conducts empirical research in the field of Macro Economics, International Economics and Financial Economics. His papers had been published in various International and National Journals, Conferences and Edited Books.



Ms Navneet Kaur Bhatia, has 13 years of academic experience. Her areas of interest are International Business, Financial Markets and Financial Management. She has presented papers in International and National conferences. She had her papers published in reputed refereed journals.



Nishant Patel, is presently pursuing MBA [MS] 5 years in International Institute of Professional Studies in Devi Ahilya Vishwavidyalaya at Indore. His area of specialization is Finance. His area of interest in research work are Macro Economics, Financial Economics, Capital & Money Market in Present Scenario