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FOREIGN DIRECT INVESTMENT AND CURRENT ACCOUNT DEFICIT- A CAUSALITY ANALYSIS IN CONTEXT OF INDIA

ABSTRACT

Current Account Deficit is one of the major macroeconomic problems facing India. In this paper, we have tried to investigate the relationship between Foreign Direct Investment (FDI) and current account in the context of India. Using the Toda-Yamamoto (T-Y) granger causality technique for the period 1975-2009, our results indicate that FDI and current account are co-integrated in the long run. There is evidence of unidirectional causality from FDI to current account. Furthermore, the analysis of FDI and international trade components (Exports and Imports), which are the major constituents of current account, supports our results of granger causality. Also, an attempt has been made to provide for the impact of FDI on current account through impulse response function.

Key Words: Foreign Direct Investment, Balance of payment, Current account, Granger Causality, Impulse response function.

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INTRODUCTION

The economic reforms and policy changes undertaken by government in 1991 brought a revolutionary change in the Indian economy. There was a shift from inward looking policy to a more liberalized and competitive approach. Since the beginning of economic reforms, policy makers have been taking initiatives that strive to achieve the objective of integrating the Indian economy with global economic system. The effect of globalization is evidenced by the recent boom in the Foreign Direct investment (FDI) inflows all over the world, especially the developing countries, including India.

The major thrust of the reforms emphasized the opening of Indian economy, favoring private sector by removal of *License Raj* [1] system and enhancing foreign investment participation. Furthermore, changes in the political climate precipitated greater acceptability of FDI. The focus shifted from foreign loans to utilizing Foreign Direct Investment as source of investment. Apart from trade as internationalization strategy, FDI gained overwhelming importance as a tool for globalization. The global stock of Foreign Direct Investment increased from US$ 2.08 trillion in 1991 to US$ 17.74 trillion in 2009 (UNCTAD, 2009).

The stock of FDI to developing countries increased from US$ 0.52 trillion to US$ 4.894 trillion from 1990 to 2009. The aggregate foreign investment in India increased from US$165 million in 1990-91 to US$ 91 billion in 2008-2009. FDI is increasingly described as source of economic growth and development that triggers technology and knowledge spillovers, contribute to international trade and commerce by enhancing exports in particular and improves the production efficiency of the host country. FDI and trade provide stimulus to economic growth and development of the recipient country.

It is, therefore, pertinent to investigate the relationship between the two variables. At the same time it is argued that widening current account deficit is one of the undesirable effects of capital flows like FDI. Calvo, Leiderman, and Reinhart (1996) observed that developing countries normally ran current account deficit and a recent surge in international capital flows to developing countries have coincided with widening current account deficits in many of these countries. FDI also affects balance on income due to increasing profit repatriation and import of high tech services.

[1] License Raj refers to the system where complex rules and regulations are required to be complied with in order to set up and run businesses in India. In other words, it is the system where economy is controlled and licenses were needed to commence enterprise.

In India, FDI inflows are integral part of Capital Account of India's Balance of Payments (BoP). India's BoP has improved considerably from US$ -2,492 million in 1991 to US$ 92,164 million in 2007-2008. FDI is non-debt financing source and statistics explain that there is a shift from reliance on debt flows to non-debt flows like FDI from 1993 onwards. The major contributing factor for this positive Balance of Payment position is surplus capital account balance which, in turn, is due to huge FDI inflows. The question of FDI outflows causing capital account deficit seemed superfluous. Consequently, the relationship between capital account and FDI does not require much investigation. But India is facing the problem of current account deficit since 1960s and the trend is still continuing. The amount of deficit rose from US$ -824 million in 1960-1961 to US$ -38,411 million in 2009-10 (Reserve Bank of India, 2010). Statistics reveal that trade deficit plays a major in causing current account deficit. FDI not only affects the domestic investment climate but also influences foreign trade by import and export of goods and services. However, the resultant impact whether it will improve or deteriorate the trade position depends on the magnitude of the two forces, namely, exports and imports.

The existing literature widely accepts the complementary relationship between FDI and exports. However, the complex relationship between current account, foreign trade and FDI is relatively unexplored. In this backdrop, there is a need to empirically investigate the causal relationship between current account and FDI as well as FDI and trade components (exports and imports) so that some policy implications can be suggested to ensure further deterioration in the current account balance. Therefore, the focus of this study is to examine the causal relationship between FDI and current account. Also, an attempt has been made to examine the causal relationship between FDI and foreign trade by analyzing the impact on imports and exports separately. This study fills the gap in the literature by providing empirical evidence on the relationship between FDI and trade deficit which, in turn, is a major contributing factor for current account deficit.

The rest of the paper is organized as follows: "Introduction" provides the review of literature. "Trends of Balance of payments and FDI" presents the current situation of Balance of Payments and FDI in India. "Data and Methodology" describes the data and methodology. "Empirical Results" provides the empirical results followed by the concluding remarks.

LITERATURE REVIEW

Capital flows like FDI are considered to be beneficial to the economic development. But the policies related to such inflows must be designed keeping in mind their cost and disruptive effects. Foreign capital flows may cause imbalance that threaten macroeconomic stability of the host country. The literature on the relationship between current account and FDI is sparse. Furthermore, the relation between FDI and trade is analyzed in isolation without considering its effect on current account deficit. Agosin and Mayer (2000) concluded that that the effects of FDI on domestic investment are by no means always favorable. There has been strong crowding in of domestic investment by FDI in Asia and by contrast, strong crowding out has been the norm in Latin America.

Turner (1991) explains that capital flows magnify current account disequilibria with deficit countries confronted by capital outflows and surplus countries by capital inflows. Sarno and Taylor (1999) assert that recent trend of capital flows to developing countries is the crucial source of financing the current account financing requirements rather than official flows. Liuyong and Yanping (2007) in their study of China from 1983 to 2005 analyzed that FDI has negative effect on current account and positive effect on capital and financial account. Hossain (2008) study reports that there is high positive correlation between FDI inflows and aggregate of exports and imports of Bangladesh. Furthermore, the net effect of FDI on current account and balance of payments is positive. Samsu, Derus, and Ooi (2008) show that FDI and exports have long term relationship and there is evidence of FDI causing exports in Malaysia. A study by Phang (1998) on FDI and Balance of Payment position of Malaysia concludes that FDI is attracted to countries with high trade potential and exports.

In their study of Spain, Bajo-Rubio and Montreo Munoz (2001) concluded that FDI and exports have complementary relationship with short run causality running from FDI to exports and long run bilateral causality between the two variables. Siddiqui and Ahmad (2007) provide evidence that FDI and current account are cointegrated and FDI may cause deterioration to Balance of payments position of Pakistan in long run. Calvo et al. (1996) observed that apart from the other macroeconomic effects of FDI on developing countries, widening current account deficit is one of major problems associated with capital inflows. The problem originates due increase in national investment and fall in national saving. Seabra and Flach (2005) found that FDI causes profit remittance and emphasized significant adverse long run effects of FDI for Brazil.

The positive impact of FDI is highlighted by Athukorala and Menon (1996) in their study of Malaysian economy which concluded that export oriented FDI brought significant returns to Malaysia due to its favorable economic climate for internationalization of production. Fry, Claessens, Burridge, and Blanchet (1995) further observed that if a country has liberal foreign exchange rate system, more FDI is likely to be independent of current account and other capital flows. Jansen (1995) further argues that export oriented FDI has positive effect on private investment and growth but it can have adverse balance of payment consequences. A study by Mucchielli and Soubaya (2000) on the determinants of the volume of trade of the French Multinational Companies advocate that inward FDI has a positive influence on foreign trades (including exports and imports), and this positive impact is stronger for exports as compared to imports.

There are divergent views whether the impact of FDI on host countries is always positive or not. It is therefore necessary to investigate the relationship between capital flows and balance of payments especially with respect to developing countries like India where current account deficit is the issue of concern for policymakers. This paper is an attempt to provide empirical evidence on the relationship between current account and FDI as well as foreign trade and FDI.

The next section exhibits the trends of Balance of Payments and foreign direct investment in India. Given the huge domestic demand and skilled labor availability at low cost, India is emerging as an attractive destination for foreign investment. Due to high FDI inflows, especially after 2000, the balance of payment position of India has improved substantially over the years.

TRENDS OF BALANCE OF PAYMENTS AND FDI

The economic reforms in India shifted the focus from import substitution to export promotion strategy to enhance foreign trade. India's BoP position improved significantly after 2001 due to high foreign investment inflows. The improved position of BoP is attributable to the huge amount of foreign investment flowing into India causing a positive impact on capital account and resulting in overall BoP position positive.

The Balance of Payments account consists of two components: (1) Current Account and (2) Capital Account.

Table 1 reveals that India's balance of payment position improved year after year due to capital account component. The maximum balance in 2007-2008 was due to huge

foreign investment in that year. The current account was in deficit since 1990-1991 except for three years while capital account always carried positive balance.

Table 1.India's Balance of Payment Position from 1990-91 to 2008-09. (Amt. in million US$)

Year/ Item	I. Current account	II. Capital account	Overall balance (I+II)
1990-91	-9680	7188	-2492
1991-92	-1178	3777	2599
1992-93	-3526	2936	-590
1993-94	-1159	9694	8535
1994-95	-3369	9156	5787
1995-96	-5912	4690	-1222
1996-97	-4619	11412	6793
1997-98	-5499	10010	4511
1998-99	-4038	8260	4222
1999-00	-4698	11100	6402
2000-01	-2666	8535	5868
2001-02	3400	8357	11757
2002-03	6345	10640	16985
2003-04	14083	17338	31421
2004-05	-2470	28629	26159
2005-06	-9902	24954	15052
2006-07	-9565	46171	36606
2007-08	-17034	109198	92164
2008-09	-29817	9737	-20080

Source: Reserve Bank of India (2010)

Current account deficit was mainly due to merchandise as reflected in Table 2. The current account balance of India consists of the following: (1) merchandise and (2) invisibles. Invisibles consist of (a) services, (b) transfers, and (c) income. Particualry, there are two categories under income, (i) investment income and (ii) compensation of employees.

Table 2 shows that India's current account balance has negative balances for all the years from 1990-1991 to 2008-2009 except for the three consecutive years from 2001-2002 to 2003-2004. The amount of current account balance in 1990-91 was US$ -9,680 million US$ reducing to US$ -2,666 million in 2000-2001 and was positive in 2003-04 amounting to US$ 14,083 million. India is facing the problem of current account deficit which is showing a rising trend year after year. Thus, it is necessary to investigate the reasons behind this worsening current account deficit. The Capital Account includes the following: (1) foreign investment (foreign direct investment and foreign portfolio

investment), (2) net external assistance, (3) net commercial borrowings, (4) rupee debt service[2], (5) non-resident deposits, and (6) other capital[3].

Table 2: India's Current Account from 1990-91 to 2008-09. (Amt. in million US$)

Year/ Item	Merchandise (A) Exports, f.o.b.	Merchandise (B) Imports, c.i.f.	I. Trade balance (A)-(B)	II. Invisibles (net)	Current account (I+II)
1990-91	18477	27914	-9437	-242	-9680
1991-92	18266	21064	-2798	1620	-1178
1992-93	18869	24316	-5447	1921	-3526
1993-94	22683	26739	-4056	2897	-1159
1994-95	26855	35904	-9049	5680	-3369
1995-96	32310	43670	-11359	5447	-5912
1996-97	34133	48948	-14815	10196	-4619
1997-98	35680	51187	-15507	10008	-5499
1998-99	34298	47544	-13246	9208	-4038
1999-00	37542	55383	-17841	13143	-4698
2000-01	45452	57912	-12460	9794	-2666
2001-02	44703	56277	-11574	14974	3400
2002-03	53774	64464	-10690	17035	6345
2003-04	66285	80003	-13718	27801	14083
2004-05	85206	118908	-33702	31232	-2470
2005-06	105152	157056	-51904	42002	-9902
2006-07	128888	190670	-61782	52217	-9565
2007-08	166163	257789	-91626	74592	-17034
2008-09	175184	294587	-119403	89586	-29817

Source: Reserve Bank of India (2010)

Note: f.o.b: Free on board, c.i.f: Cost, Insurance and Freight

The capital account of India has shown a rising trend since 1990 as shown in Table 3. In the initial years the major part of capital account was in the form of external assistance and commercial borrowings but the trend changed after 1993-1994 when foreign investment became the major component of capital account. There is a substantial decline in 2008-2009 which can be due to the global meltdown.

Foreign direct investment in India has shown a rising trend from 2000-01, increasing substantially after 2005-06. The foreign direct investment inflows increased from US$ 165 million in 1990-91 to US$ 34 billion in 2008-09 as per international best practices (DIPP, 2009). The cumulative amount of FDI from August 1991 to March 2009 is US$ 141 billion (DIPP, 2009).

[2] Rupee debt service includes principal repayments on account of civilian and non-civilian debt in Respect of Rupee Payment Area (RPA) and interest payment thereof.

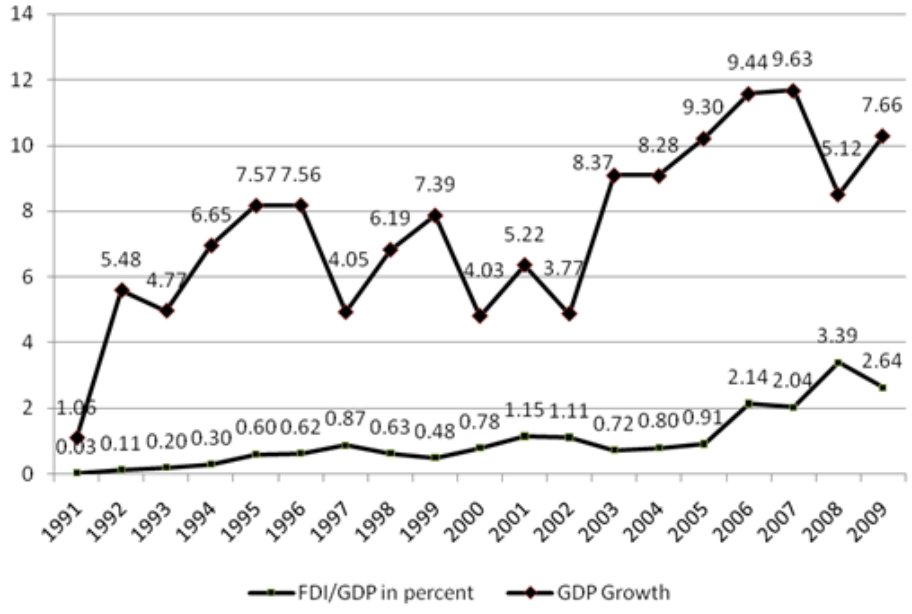
[3] Other capital comprises mainly the leads and lags in export receipts.

Table 3: Capital Account Balance from 1990-1991 to 2008-2009 (Amt. in million US$)

Year/ Item	A) Foreign Investment	B) External Assistance	C) Commercial Borrowings	D) Rupee Debt Service	E) Non-Resident Deposits	F) Other Capital	Capital Account (A to F)
1990-91	103	2210	2248	-1193	1536	2284	7188
1991-92	133	3039	1456	-1240	290	101	3777
1992-93	557	1859	-358	-878	2001	-245	2936
1993-94	4233	1901	608	-1054	1207	2800	9694
1994-95	4922	1526	1030	-983	172	2489	9156
1995-96	4803	884	1275	-952	1104	-2425	4690
1996-97	6154	1109	2848	-727	3350	-1321	11412
1997-98	5390	907	3999	-767	1125	-643	10010
1998-99	2412	820	4362	-802	961	508	8260
1999-00	5191	901	313	-711	1540	3866	11100
2000-01	6791	427	4308	-617	2316	-4690	8535
2001-02	8146	1204	-1588	-519	2754	-1640	8357
2002-03	6015	-3096	-1701	-474	2978	6918	10640
2003-04	15678	-2754	-2928	-376	3642	4076	17338
2004-05	15298	2027	5426	-417	-964	7259	28629
2005-06	21395	1766	2759	-572	2789	-3183	24954
2006-07	29743	1787	16443	-162	4321	-5961	46171
2007-08	63630	2118	22665	-121	179	20727	109198
2008-09	21127	2646	6938	-101	4290	-25163	9737

Source: Reserve Bank of India (2010)

Figure 1: GDP growth (in percent) and GDP/FDI (in percent) from 1991 to 2009



The average GDP growth in the post 1991 hovered around 6.3%. The average FDI as a percentage of GDP was 1.02%. It implies therefore that FDI in India was not increasing at a rapid pace consistent to GDP growth. But it improved significantly after 2005 due to huge surge in absolute FDI inflows. Mauritius has been the largest foreign direct investor having 44% share of the total FDI received in India from April-2000 to March-2009. Service sector has been the most lucrative sector for foreign investment with 23% of total FDI in this sector followed by computer hardware and software from April, 2000 to March, 2009.

DATA AND METHODOLOGY

The annual data from 1975 to 2009 is taken from International Monetary Fund (IMF) and World Bank's (World Bank, 2009) indicators. Also data is obtained from Handbook of statistics on Indian Economy (various issues) by Reserve Bank of India, various issues of FDI Fact Sheet published by Department of Industrial Policy and Promotion.

To examine the causality between FDI and current account, granger causality tests have been used. FDI refers to FDI inflows as percentage of GDP and current account (CUR) is the current account as a percentage of GDP taken from World Development Indicators. Since conventional F- test gives spurious results if the data is not stationary (Toda and Yamamoto, 1995; Yamada and Toda, 1998), we have used MWald granger no causality test in Vector Auto Regressive (VAR) framework. Proposed by Toda and Yamamoto (1995) and Rambaldi and Doran (1996), this test gives an asymptotic chi-square (χ^2) for null distribution in VAR framework irrespective of the presence or absence of cointegration properties of the data. However, testing the data for unit root and integration properties complements the results of Granger causality.

We have used the FDI as a percentage of GDP denoted by FDI to examine the causality between FDI & imports and FDI & exports. We have taken data variables as a percentage of GDP as the data for imports and exports in absolute terms was not stationary at first difference and second difference. Taking third difference and lags will reduce the number of observations for further analysis leading to incorrect conclusions. Accordingly, exports (EXP) refer to exports as a percentage of GDP and imports (IMP) refer to imports as a percentage of GDP.

Testing the stationary properties and order of integration

We employed Augmented Dickey Fullar (ADF) Test and Phillips-Perron (PP) Test to figure out the stationary properties of the series. The advantage of PP test is that its results are robust to general forms of hetroskedasticity in the error term. The critical value of ADF is provided by MacKinnon. The null hypothesis of unit root test is that series are non stationary or contain a unit root. The regression equation for FDI and Current Account (CUR) for unit root is given by

$$\Delta FDI_t = \alpha FDI_{t-1} + \beta_1 \Delta FDI_{t-1} + \beta_2 \Delta FDI_{t-2} + \ldots\ldots\ldots + \beta_p \Delta FDI_{t-p} \quad (1)$$

$$\Delta CUR_t = \alpha CUR_{t-1} + \beta_1 \Delta CUR_{t-1} + \beta_2 \Delta CUR_{t-2} + \ldots\ldots\ldots + \beta_p \Delta CUR_{t-p} \quad (2)$$

Where ΔFDI is the first difference of FDI and ΔCUR is first difference term of current account.

The test of unit root is conducted on the coefficient of FDI_{t-1}. If the beta values are significantly different from zero, then we reject the null hypothesis that FDI contains unit root. PP test is an alternative method to correct serial correlation in unit root testing. It is similar to ADF but modifies t-ratio such that asymptotic distribution of test statistic is unaffected by serial correlation.[4]

The lag order (*l*) is determined using Hannan and Quinn Information Criteria (HQIC), Akaike Information Criterion (AIC) and Schwarz Bayesian Information Criterion (SBIC) used popularly in the literature.

Testing the cointegration properties

Once the data was found stationary at levels or first difference, we examined the existence of long term relationship in the examined variables. We have used Johansen and Juselius method to determine the number of cointegrating vectors based on maximum likelihood estimation of VAR framework. The test uses trace statistic and maximum eigenvalues to conclude the relationship between the variables. If the variables are cointegrated, it implies that there exist a stable and long run relationship between the variables. Presence of cointegration also implies at least one direction of causality. The Johansen test identifies

[4] ADF uses parametric autoregressive structure to capture serial correlation as compared to PP test which uses non-parametric corrections.

multiple cointegration relationships. In Johansen technique, the vector y_t which can be expressed as a VAR with *l* lags:

$$y_t=A_1y_{t-1}+ A_2y_{t-2}\ldots\ldots..+ A_ly_{t-l}+ \varepsilon_t \quad (3)$$

Where, y_t is a vector (n x 1); A_i is the parameters matrix (n x n).

In an error correction mechanism, the above equation can be expanded as:

$$\Delta y_t = \Gamma_1\Delta y_{t-1} + \ldots.+\Gamma_1\Delta y_{t-l+1} + \Pi\, y_{t-l} + \varepsilon_t \quad (4)$$

Where $\Gamma_i=-(I-A_1-\ldots-A_i)$, i=1, *l*−1; $\Pi=-(I-A_1-\ldots-A_l)$, $\Pi=\alpha\beta$, α represents the speed of adjustment and β the matrix of long-run coefficients.

Granger no causality test

The last step is to identify the causal relationship in the variables. Variable A is said to Granger cause variable B, if the lags of A can improve a forecast for variable B. In a VAR model, the null hypothesis that variable A does not Granger cause variable B, if all the coefficients on the lags of variable A are zero in the equation for variable B. We have used MWald test to test for Granger causality. The VAR model in the bivariate framework for FDI and CUR is given by

$$FDI_t= \lambda_o+ \sum_{i=1}^{l+r} \alpha_{1i}FDI_{t-i} + \sum_{i=1}^{l+r} \beta_{1i}CUR_{t-i} + e_{1t} \quad (5)$$

$$CUR_t= \lambda_o+ \sum_{i=1}^{l+r} \alpha_{2i}CUR_{t-i} + \sum_{i=1}^{l+r} \beta_{2i}FDI_{t-i} + e_{2t} \quad (6)$$

Where FDI is the FDI as a percentage of GDP, CUR is the current account balance as a percentage of GDP, *l* is the optimum lag order, r is the order of integration, α and β are the coefficients of FDI and CUR and e_1 and e_2 are the white noise error terms. From the equation 5, the null assumption is that CUR does not granger cause FDI if the beta value

is zero i.e if H_0: $\beta_1 = 0$ (CUR ⇏ FDI). In equation 6 the null assumption is that FDI does not granger cause CUR if H_0: $\beta_2 = 0$ (FDI⇏CUR).

Similarly, we have causal equations for FDI and exports in a bivariate VAR framework as

$$FDI_t = \lambda_o + \sum_{i=1}^{l+r} \alpha_{1i} FDI_{t-i} + \sum_{i=1}^{l+r} \beta_{1i} EXP_{t-i} + e_{1t} \quad (7)$$

$$EXP_t = \lambda_o + \sum_{i=1}^{l+r} \alpha_{2i} EXP_{t-i} + \sum_{i=1}^{l+r} \beta_{2i} FDI_{t-i} + e_{2t} \quad (8)$$

Where FDI is the FDI as a percentage of GDP and EXP is the exports as a percentage of GDP. The null assumption in equation 7 is that EXP does not granger cause FDI if the beta value is zero (EXP ⇏ FDI). In equation 8, the null assumption is that FDI does not granger cause EXP if H_0: $\beta_2 = 0$ (FDI ⇏ EXP).

Equation for imports in VAR model is given by:

$$FDI_t = \lambda_o + \sum_{i=1}^{l+r} \alpha_{1i} FDI_{t-i} + \sum_{i=1}^{l+r} \beta_{1i} IMP_{t-i} + e_{1t} \quad (9)$$

$$IMP_t = \lambda_o + \sum_{i=1}^{l+r} \alpha_{2i} IMP_{t-i} + \sum_{i=1}^{l+r} \beta_{2i} FDI_{t-i} + e_{2t} \quad (10)$$

where IMP is the import as percentage of GDP. Following equation 9 the null assumption is that IMP does not cause FDI and vice versa for equation 10.

EMPIRICAL RESULTS

This section presents the results of the granger causality test discussed in the previous section. The results presented in Tables 4 and 5 provide for the stationarity of the examined variables. The variables are not stationary at levels reflected by Table 4.

However, all the variables are stationary at first difference as the test statistic values of both ADF and PP test are lower than the critical values (see Table 5).

Table 4: Results of ADF and PP Test for Unit Root at Levels

Variable	Test statistic ADF	Test statistic PP test	5% critical value
CUR	-1.776	-8.112	-2.975
FDI	0.485	0.397	-2.975
EXP	3.294	4.741	-2.975
IMP	3.773	4.607	-2.975

Table 5: Results of ADF and PP Test for Unit Root at First Difference

Variable	Test statistic ADF	Test statistic PP test	5% critical value
CUR	-4.908	-27.977	-2.978
FDI	-5.978	-44.732	-2.978
EXP	-5.270	-5.479	-2.978
IMP	-4.351	-4.463	-2.978

After examining the stationary properties, we selected the optimum lag using Akaike information criteria (AIC), Schwartz Bayesian (SBIC) and Hannan and Quinn (HQIC) information criteria used popularly in the literature. Table 6 reflects that the optimum lag for FDI and CUR is 3 given by HQIC and AIC criteria. However, SBIC is giving a zero lag. For further analysis we have selected lag order of three (*l=3*) to examine the cointegration and causality relationship between the examined variables.

Table 6: Lag Selection Criteria

Sample: 1980 - 2009 Number of observations = 30

Lag order	HQIC	AIC	SBIC
0	3.19852	3.22805	3.29282*
1	3.36367	3.45226	3.64656
2	3.24185	3.38951	3.71333
3	2.82727*	3.034*	3.48735
4	2.98546	3.25125	3.83412

* is the optimum lag order.

Since the series are integrated of order one, we established a long run relationship between the two series using Johansen test for cointegration. The results in Table 7 indicate that FDI and CUR have long run relation for the two periods as the Eigen values and values of trace statistic are higher than critical values. This implies that there exists a

stable long run relation between FDI and current account. Similarly, FDI has a long term relationship with exports and imports.

Table 7: Johansen Test of Cointegration with Constant Trend in VAR for FDI and CUR, FDI and EXP & FDI and IMP

Null Hypothesis	Maximum Eigen values	5% critical value	1% critical value	Trace statistic	5% critical value	1% critical value
FDI and Current Account						
r = 0	26.4702**	14.07	18.63	26.6638**	15.41	20.04
r ≤ 0	3.9902	3.76	6.65	3.9902	3.76	6.65
FDI and Exports						
r = 0	19.8521**	14.07	18.63	21.2066**	15.41	20.04
r ≤ 0	1.3545	3.76	6.65	1.3545	3.76	6.65
FDI and Imports						
r = 0	26.5579**	14.07	18.63	26.5581**	15.41	20.04
r ≤ 0	0.0002	3.76	6.65	0.0002	3.76	6.65

Given the order of integration (r=1) and optimum lag length (*l=3*), we conducted Granger causality test using Wald test to examine the causal link between FDI and CUR. In a VAR model, null hypothesis that variable X does not granger cause Y, if all the coefficients of X are zero in the equation for Y.

The results presented in Table 8 indicate that the null hypothesis that CUR does not granger cause FDI is not rejected as the value is insignificant (0.541). On the contrary we reject the null hypothesis that FDI does not granger cause CUR. The significant value of 0.004 implies that FDI causes current account deficit. Since FDI is not a part of current account, it may be asked as to how FDI can cause current account deficit. The issue can be resolved by analyzing the relationship between FDI and exports as well as FDI and imports. The data on current account balance manifests that the merchandise balance (Exports-Imports) is main cause of current account deficit. Consequently, we analyzed the relationship between FDI and individual components of merchandise to investigate whether FDI has indirect effect on current account. There exists a long term relationship between FDI and EXP and FDI and IMP as reflected by Table 7.

Table 8: Toda Yamamoto Granger No Causality Test for FDI and CUR

Number of Observations: 30 Optimum Lags: 3

Null Hypothesis	Values
CUR ⇏ FDI	2.1557 (0.541)
FDI ⇏ CUR	13.394 (0.004)*

Note: Figures in parentheses are p values.

It can be inferred from Table 9 that there is bidirectional relationship between FDI and exports & FDI and imports for the period of study. We reject the null hypothesis that FDI does not granger cause exports and vice versa and FDI does not granger cause imports and vice versa. Since FDI is affecting foreign trade position by causing imports and exports, the resultant impact whether it will improve or deteriorate the trade position can be accounted for by analyzing the magnitude of impact of FDI on the two forces.

Table 9: Toda Yamamoto Granger No Causality Test for FDI and EXP & IMP

Number of Observations: 30 Optimum Lags: 3

Null Hypothesis	Values
EXP ⇏ FDI	17.359 (0.001)*
FDI ⇏ EXP	28.930 (0.000)*
IMP ⇏ FDI	24.826 (0.000)*
FDI ⇏ IMP	16.444 (0.001)*

Note: Figures in parentheses are p values.

In order to understand the magnitude of effect of FDI on exports and imports we established the imports and exports as function of FDI. The regression equations of import function and export function are given by:

$$EXP_t = \alpha_{1t} + \beta_{1t} FDI + \varepsilon_{1t} \quad (11)$$

$$IMP_t = \alpha_{2t} + \beta_{2t} FDI + \varepsilon_{2t} \quad (12)$$

Where EXP is the log value of Exports as percentage of GDP at time t, IMP is the log value of imports as percentage of GDP at time t, α is the intercept, β_1 and β_2 are the beta coefficients respectively and ε_1 and ε_2 are the error terms.

Table 10 provides the result of export and import function expressed by equation 11 and 12. The beta values for FDI are significant at 5% confidence level. Thus FDI is one of the important determinants of export and import respectively. However, 1% increase in FDI raises imports by 1.57 times as compared to exports which rises by 1.01 times. As a result, the magnitude of imports due to FDI is more as against exports. The variance of imports explained by FDI is 22% given by adjusted R-square value in contrast to exports variance which is merely 12% of the total.

Table 10: Results of regression for imports and exports

Dependent Variable	Coef.	Beta values of FDI	Number of observations	Adjusted R-square
EXP	.4998 (.1601)	1.017** (.4355)	34	0.1189
IMP	.5638 (.1781)	1.573** (.4848)	34	0.2242

Notes: Figures in parentheses are standard errors.

** Represents significance at 5% confidence level.

Impulse response fuction

The effect of one variable on the other can be easily analyzed by the coefficients. However, in order to analyze the effect of external shocks on the variables, we have used Impulse Response Function (IRF) in time series analysis. IRF explains how an expected change in one variable in the beginning affects the other through time. In other words, we are analyzing the shocks coming from the error term related to FDI and how it changes CUR. Considering the bivariate framework of equation (5) and (6) for FDI and CUR, the equation for IRF is given by:

$$\Omega i = \Phi_i B^{-1} \Lambda^{1/2} \qquad (13)$$

where B^{-1} is the matrix of coefficients of all the variables at time t; $\Lambda^{1/2}$ is the lower Cholesky decomposition of the variance-covariance matrix of ε_t(both Λ and $\Lambda^{1/2}$ are diagonal matrices with zero non-diagonal elements); and, Φ_i is another matrix that contains the effects of a one-unit increase inerror term at date t (ε_t) on the value of the y variable at time t+s:

$$\Phi i = \frac{\partial yt+s}{\partial \varepsilon t} \qquad (14)$$

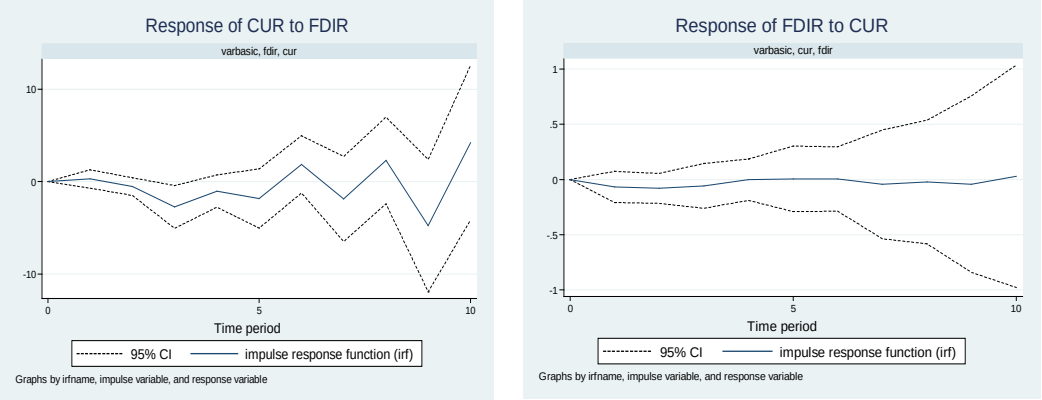
In order to analyze how error terms ε_{1t} and ε_{2t} are affecting FDI and CUR, we have IRF as:

$$\Psi_i = \begin{bmatrix} Effect\ of\ \varepsilon 2t \text{ on CUR} & Effect\ of\ \varepsilon 1t \text{ on CUR} \\ Effect\ of\ \varepsilon 2t \text{ on FDI} & Effect\ of\ \varepsilon 1t \text{ on FDI} \end{bmatrix}$$

where the elements of matrix will be different at each point of time.

Impulse Response of FDI to CUR and vice versa is explained by Figure 2 (a) and 2 (b). The horizontal axis has the time horizon for 10 years and vertical axis are the responses of FDI and CUR respectively. The central line is the calculated values of response function and the dotted lines are the critical interval values. If we introduce one period shock to FDI the response of CUR is negligible. Nonetheless, in the long time period FDI has a negative effect on CUR in Figure 2(a). Since there is no causality running from CUR to FDI, the response of FDI to CUR is non extinctive depicted by Figure 2 (b).

Figure 2: (a) Impulse Response Function of CUR to FDI (left), (b) Impulse Response Function of FDI to CUR (right)



Similarly, we can have the IRFs for imports and exports also explaining the shocks between the variables.

Figure 3(a) reflects that one period shock in FDI has negative effect on exports which improves over time but in the long run there are fluctuations in exports caused by FDI. In contrast EXP has a positive effect on FDI which implies that EXP always has favorable

effect on FDI to India. Similarly, shock in IMP has positive impact on FDI, making it one of the important factors to allure FDI shown by Figure 3(b).

Figure 3: (a) Impulse Response Function of EXP to FDI (left), (b) Impulse Response Function of FDI to EXP (right)

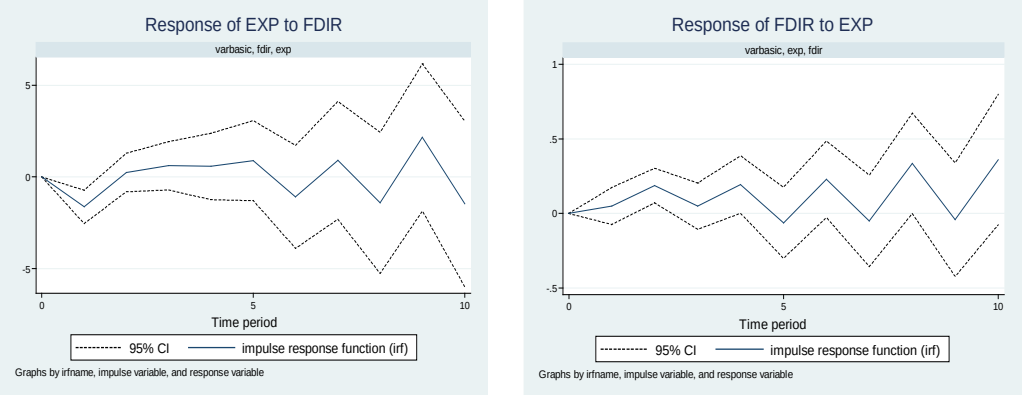
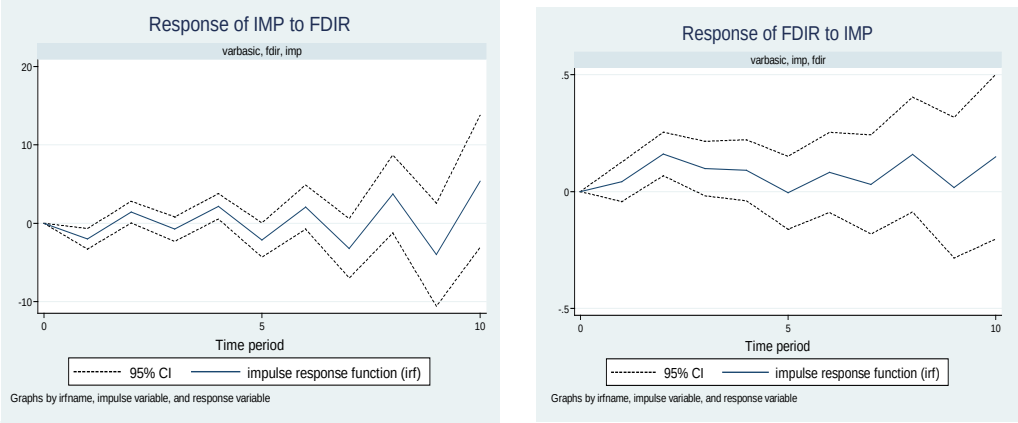


Figure 4: (a) Impulse Response Function of IMP to FDI (left), (b) Impulse Response Function of FDI to IMP (right)



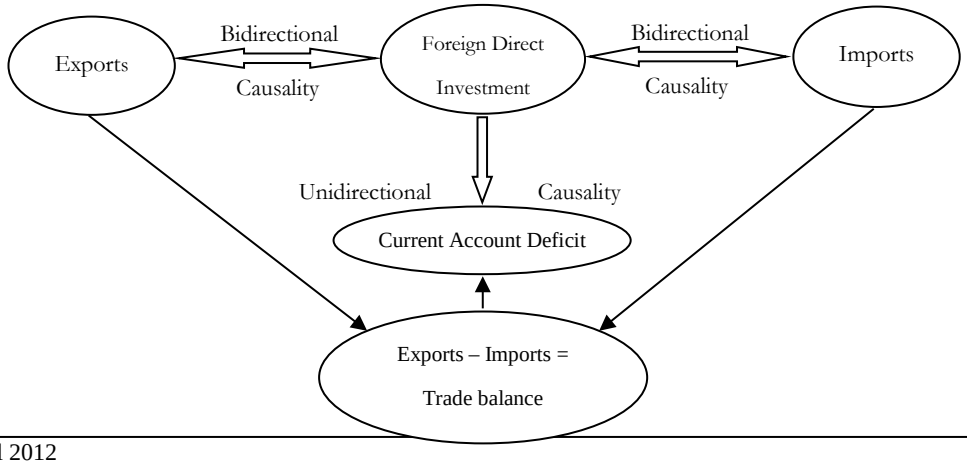
But one period shock in FDI is negative but over the period of time it is fluctuating thereby causing fluctuating imports over the long run time period in response to FDI. This leads to a serious consideration towards FDI policy issues regarding further liberalization of international investment regime. In other words, FDI policy should be made more export intensive rather than enhancing import based consumption in India.

CONCLUSION

In this paper, we have econometrically analyzed and examined the causal relationship between FDI and current account. The investigation of this relationship is crucial for country like India where current account deficit is one the major macroeconomic problems. At the same time, there have been consistent efforts undertaken by policymakers to liberalize the international investment regime to attract foreign investment to India. The assumption that underpins such liberalization is that FDI promotes domestic investment and provides opportunities for growth in terms of technology and knowledge spillovers along with creating employment avenues. However the actual benefits or costs of FDI are associated with country's vulnerability to FDI as there are evidences of FDI crowding in domestic investment. It is to be understood that FDI is not an alternative rather it complements the domestic investment.

Our results conclude that there is existence of unidirectional causality from FDI to Current Account for the period 1975 to 2009. The results of cointegration conclude that there is also long term relationship between the two. Since FDI is not affecting current account directly, we delved into the reason behind the causality from FDI to CU by analyzing the relationship between FDI and components of international trade. T-Y granger causality test results reflect bidirectional causality from FDI to imports and vice versa and FDI to exports and vice versa. Thus, FDI has a significant influence on international trade components. Simultaneously, FDI itself is influenced by the trade components. But the magnitude of impact of FDI is more on imports than that on exports as revealed by results of linear regression. The results are summarized in Figure 5.

Figure 5: Relationship between FDI and CUR, Trade Components of CUR



The business facilitation measures in the form of treaties and Investment Promotion Agencies must be complemented by sound infrastructure, efficient economic policies, good political environment and corporate governance norms to exploit the benefits from FDI. The recent protest on FDI in retail reflects that the political environment of India is not merely sabotaging the important reforms but they are also throwing up roadblocks to broadening of post-1991 reforms that is so badly needed today. Multi brand retailers should not be viewed from imports perspective only but their export potential should be duly appreciated. FDI in retail should be viewed as an effort which is pro-poor but not pro-rich.

The policy makers should not take the growth effects of FDI for granted. It can be construed from the above that as a policy implication FDI can cause serious deterioration to Balance of Payments position by causing current account deficit in a long run. The policies should be framed keeping in mind export promoting FDI rather than import based consumption by FDI, other things remaining the same. The imports increase due to import of foreign technology and raw material by FDI companies. Export oriented FDI will not only improve trade situation but also improvise current account deficit situation from further deterioration. Further, FDI should be directed to income generating activities such that the outflow through profit remittances to home countries is offset by income to the host country employees. The research can be further extended to analyze how profit remittances to home countries by direct investors contribute to current account deficit.

REFERENCES

Agosin, M. R. and R. Mayer. 2000. Foreign investment in developing Ccountries: Does it crowd in domestic investment?. *UNCTAD Discussion Paper* 146. Geneva: UNCTAD.

Athukorala, P and J. Menon. 1996. Foreign investment and industrialization in Malaysia: Exports, employment and spillovers. *Asian Economic Journal* 10 (1): 29-44.

Bajo-Rubio, O. and M. Montreo-Munoz. 2001. Foreign direct investment and trade: A causalityAnalysis. *Open Economies Review* 12 (3): 305-323.

Calvo, G. A., L. Leiderman, and C. M. Reinhart. 1996. Inflows of capital to developing countries in the 1990s. *Journal of Economic Perspectives*. 10 (2): 123-139.

DIPP 2009. *Fact sheet on FDI, FDI statistics 2009*. New Delhi: Government of India.

Fry, M., S. Claessens, P. Burridge, and M. Blanchet. 1995. Foreign direct investment, other capital flows and current account deficits: What causes what?. *World Bank Policy Research Working Paper* No. 1527.

Hossain, M. A. 2008. *Impact of foreign direct investment on Bangladesh's balance of payments: Some policy implications*. Policy Note No. 08005. Dhaka: Bangladesh Bank.

Jansen, K. 1995. The macroeconomic effects of direct foreign investment: The case of Thailand. *World Development* 23 (2): 193-210.

Liuyong, Y. and Z. Yanping. 2007. Empirical analysis of the impact of FDI on China's Balance of Payments. *International Conference on Wireless Communications, Networking and Mobile Computing (Sept. 25-27, 2007)*. Shanghai, China.

Mucchielli, J. L. and I. Soubaya. 2000. Trade and foreign direct investment: An analysis of intra-firm and arm's length trade of French multinational firms. *Paper presented at the Pacific Rim Conference (Jan. 11-16, 2000)*. Sydney, Australia.

Rambaldi, A. N. and H. E. Doran. 1996. Testing for Granger non-causality in cointegrated systems made easy. *Working Papers in Econometrics and Applied Statistics* 88. Amidale, NSW: Department of Econometrics, University of New England.

Reserve Bank of India. 2010. *Handbook of Statistics on Indian Economy*. Mumbai: RBI Publication.

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 (12): 177-183.

Sarno, L. and M. P. Taylor. 1999. Hot money, accounting labels and the permanence of capital flows to developing countries: An empirical investigation. *Journal of Development Economics* 59 (2): 337-364.

Seabra, F. and L. Flach. 2005. Foreign direct investment and profit outflows: a causality analysis for the Brazilian economy. *Economics Bulletin* 6 (1): 1−15.

Siddiqui, D. A. and M. H. Ahmad. 2007. The causal relationship between foreign direct investment and current account: An empirical investigation for Pakistan economy. *MPRA Paper* No. 19743.

Toda, H. Y and T. Yamamoto. 1995. Statistical Inference in Vector Autoregressions with Possibly integrated Processes. *Journal of Econometrics* 66 (1-2): 225-250.

Turner, P. 1991. Capital flows in the 1980s: A survey of major trends A Survey of Major Trends. *BIS Economic Papers No. 30*. Basle: Bank for International Settlements, Monetary and Economic Department.

UNCTAD. 2009. *World investment report 2009*. New York: United Nations.

World Bank. 2009. *World development indicators 2009*. Washington D.C.: World Bank Group.

Yamada, H. and H. Y. Toda, 1998. Inference in possibly integrated vector autoregressive Models: Some finite sample evidence. *Journal of Econometrics* 86 (1): 55-95.