

Impact of Capital Account Openness, Trade Balances and Exchange Rates on Economic Growth: The Evidence from India (1990-2013)

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Abstract

This paper is an attempt to verify the impact of the capital account openness on economic growth (proxied as the index of industrial production, IIP) along with other macro variables such as trade balances (measured as a ratio of exports to imports, X/M) and exchange rates (real effective exchange rate, REER) of India for the post liberalization period, 1990-2013. The quarterly data of the variables for the study period suggest that the capital account openness proxied as foreign capital inflows had impacted the index of industrial production (IIP) along with trade balances and REER. The estimation of Johansen's cointegration model confirms the long run relationship between these variables. The short run dynamics studied through VECM model suggests that there exists a bilateral short run causal relationship between capital flows and IIP; and trade balances and IIP. Though IIP has the short run impact on REER, the converse could not be found. In view of these empirical findings further liberalization of capital account, stabilizing trade deficits and reducing exchange rate fluctuations have been recommended for higher and sustainable economic growth in India.

I Introduction

The open trade and capital flows regimes have been supported and advocated on several theoretical grounds: enhancing economic growth through the operation of foreign trade multiplier, gains due to specialization based on comparative advantage, widening market size, availability of cheaper capital goods needed for development, access to the international capital and technology, availability of skilled manpower, competition, resource allocation gains and market discipline. For well over four decades after its independence, India followed a 'closed' economic policy. Economic liberalization was not considered a *sine qua non* for growth and development. Agriculture was the mainstay of the economy, both in terms of contribution towards growth and employment generation. Needless to say, industry and service sectors were not accorded due emphasis since they were not recognized as future engines of growth. The result was evident as the country continued to languish under the 3.5% 'Hindu Rate of Growth'. With a sense

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of urgency and to improve agriculture production, India ushered in the Green revolution. Nevertheless, the much needed 'big push' required for development of secondary and tertiary sectors was conspicuous by its absence. While the country's East Asian neighbors like China, Korea and Taiwan embraced financial and economic liberalization since 1970s, India was still skeptical about its utility. The country lagged behind Asian Tigers by a big margin in major growth parameters; of course, the Asian Tigers bore the brunt of the South East Asian crisis while India emerged unscathed. Though formal measures to liberalize the economy were undertaken only from 1991 onwards, there were changes in policies since the mid 1980s. During this period, a host of measures were adopted, which included deregulation of industrial controls, liberalization of capital goods imports, shift from quantitative restrictions to tariffs, greater subsidies for exports and policy of active exchange rate depreciation etc. For the first time, a three-year import-export policy (1985-88) was adopted in order to impart stability to the policy framework. During post liberalization, on the basis of recommendations made by Rangrajan Committee, external sector reforms were initiated. Major recommendations included the dismantling of trade restrictions, transition to a market determined exchange rate regime (referred to as a Liberalized Exchange Rate Management System) and gradual opening of capital account. In 1997, Tarapore committee submitted a report on Capital Account Convertibility which provided the initial roadmap for liberalization of capital account transactions, subject to certain pre-conditions in the light of international experience. Based on the success of the measures adopted, the issue of capital account liberalization was re-examined by Tarapore committee II, setup in the year 2006. However, despite clear signs of initial success, the committee did not recommend unlimited opening of capital account but preferred a phased liberalization of controls. As India continued with capital account openness several studies have emerged to verify the impact of such a policy on macro economic variables in India. Estimating co-integration and Error Correction Models Ramakrishna et al, (2013) find that the inflow of foreign capital and portfolio investments caused positively the change in the Index of Industrial production (IIP) i.e. economic growth in India. Izhar (2008), concludes that there is long run equilibrium relation between real effective exchange rate and total capital inflows and both the variables are bi-directionally causally related. Contrarily, Pradhan (2011) finds no evidence of causation between capital inflows and economic growth. In a similar study, Sethi (2006) also concludes that capital inflows have not contributed much towards industrial production or economic growth. However, there are no studies involving capital flows along with trade balances and REER in explaining economic growth of India. The present study is an attempt in this direction, which uses long period data involving Johansen cointegration and error correction (VECM) framework. The study is structured as follows; in the second section we present the review of theoretical issues and empirical evidences. The third section is on Indian experience relating capital account liberalization. Data sources and econometric models are presented in the fourth section. This section also deals with the data analysis and findings. And the final section is on summary and conclusion.

II. Review of Theoretical Issues and Empirical Evidences

Theoretical arguments for the benefits of capital account convertibility are well documented in the literature (see, Quinn and Clan, 1997, and Edison *et al*, 2002). The arguments presented were: cross border transfer of funds deepen the international division of labor and thus increases the welfare of a society; allowing domestic residents to hold internationally diversified portfolios reduces financial risks; removing restrictions on capital mobility tends to attract capital inflows and thus uses foreign savings for financing domestic projects; foreign competition improves the efficiency of the domestic financial system. Much of the empirical work on the benefits of capital flows relate to the contribution of capital account openness to economic growth. Despite the strong theoretical presumption that financial openness should boost growth in developing countries, macroeconomic evidence of the growth benefits of financial openness remains elusive (Kose et al., 2006; Kletzer, 2005). The evidence provided by Edison, Rose, Ricci and Slok (2002) is in favor of financial integration promoting economic growth. Kohli (2001) presents evidence for the relation between capital inflows and some macroeconomic variables in India. She concludes that portfolio flows are more volatile than domestic investment flows. FDI is long-term in nature, less susceptible to sudden withdrawals and leads to productive use of capital and economic growth. However, it does not reveal a stable and dominating trend. Wade and Veneroso (1998) stating that capital controls have become fashionable largely due to the Asian economy crises argue that capital inflows, especially the borrowing of foreign money, and outflows in the region should be regulated. Rangarajan (1998) argues that free capital inflows in a flexible exchange rate regime would lead to exchange rate overshooting. Increase in imports would lead to a deficit in the current account of BOP. IMF (1998) believes that the main reason for the crisis was the weak financial system in the East Asian countries. It argues that inefficient investment spending and over-investments in excessively risky projects lead these countries to the crisis. It was also felt that capital account liberalization was undertaken before the domestic banking and financial sector was sufficiently liberalized. Krugman (1998) feels that the crisis is due to crony capitalism and these countries can have a respite with temporary capital and exchange controls. Rodrik (1998) argues that the benefits of removing capital controls are yet to be demonstrated and the judicious application of capital controls might have prevented the volatility observed in these countries. Although there is a positive correlation between measures of financial openness and growth, this disappear once one control for other determinants of growth such as financial development, quality of institutions, and macroeconomic policies. More recent evidence based on better measures of de facto financial openness or specific types of liberalization (such as equity market liberalizations) show positive effects. Analysis based on industry or firm level data is also more supportive of the efficiency and growth benefits of financial globalization. But this evidence is hardly conclusive. The post South East Asian crisis policy debates focused on vulnerabilities inherent in an economy, especially its maturity and currency mismatches. Athukorala (2003) shows in the context

of the East Asian crisis that no major discontinuity in FDI inflows (except for a brief and modest decline) were detected in the region, with a limited outflow observed during the height of the crisis. The positive impact of capital account openness on growth is less ambiguous for foreign direct investment (FDI). Moreover, there is some evidence of a “threshold effect,” whereby a country’s absorptive capacity must exceed a certain amount in order to exploit the benefits of capital inflows (Arteta et al., 2001). There are a few studies available on panel cointegration methods in studying the capital flows and economic growth involving several countries (See, Gupta, 2005). However, the evidence is not conclusive and sometimes mixed. The possibility that FDI inflows are attracted only to countries with a sufficient degree of governance or rule of law has also been subject of debates. The study of Prasad et al. (2003) by using the ratio of gross stock of foreign financial assets and liabilities to GDP as the measure of capital account openness concludes that financial integration is neither a necessary nor a sufficient condition for achieving high rate of growth. The ratio of short-term debt to reserves has been shown as a probabilistic measure of an impending currency crisis (Rodrik and Valasco, 1999).

Regarding Indian experience, Chandrasekhar (2002) feels that while perceptible liberalization has taken place since the 1990s, full capital account convertibility would require further steps on all fronts. Liberalization so far has occurred in line with broad reforms being undertaken elsewhere in the economy, such as the export-import, banking sector and financial reforms. Ahluwalia (1996) feels that reorientation of India’s industrial and trade policy regimes, since the balance of payments crisis in 1991, has had the effect of significantly raising the growth rate of GDP from 1 percent per annum to over 5 percent per year by 1994. Rangarajan Committee (1993) feels that certain pre-conditions are necessary for the success of capital account convertibility: (i). Need to contain current account deficit within limits (ii). Compositional shift in capital flows away from debt to non-debt creating flows (iii). Strict regulation of external commercial borrowings especially short-term debt and (iv). Discourage volatile elements of flows from non-resident Indians. Gradual liberalization of outflows and disintermediation of Government in the flow of external assistance was stressed as vital reform measures. The Committee also recommended the liberalization of current account transactions leading to current account convertibility and the need to contain current account deficit within limits. Saha (2002) opined that while most of the targeted recommendations put forward by Rangarajan and Tarapore are in place at the moment, the fiscal deficit to GDP ratio and ratio of non-performing assets to total advances of the banking system are risky factors impeding full capital account convertibility. He also stressed FDI as a vital factor. Foreign investment, especially FDI, is accompanied by a transfer of state of the art technology and better management and operational practices, which enhance the productivity of the sectors obtaining the investment.

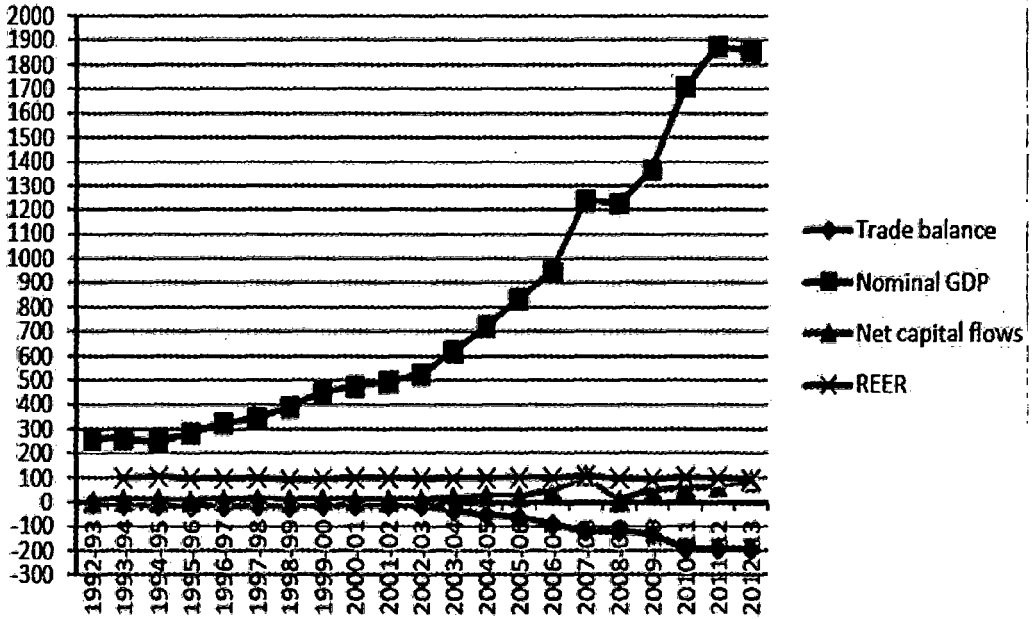
Several of the recommendations of Tarapore Committee have been implemented in India. Thus, while the inflows from abroad have been freed to a large extent, outflows associated with these inflows, such as interest, profits, sale proceeds and dividends, are completely free of any restriction. All current earnings of NRIs in the form of dividends, rent, etc have been made fully repatriable. Reddy (1997) feels that, credible macroeconomic, structural and stabilization programs encompassing trade, industry, foreign investment, exchange rate, public finances and the financial sector in general was put in place creating an environment conducive for the expansion of trade and investment. Trade, exchange rate and industrial policies should form part of an integrated policy framework if the aim is to improve overall productivity, competitiveness and efficiency of the economic system in general and the external sector in particular. Chandrasekhar, et al (2002) feel that while perceptible liberalization has taken place since the 1990s, full capital account convertibility would require further steps on all fronts. Liberalization so far has occurred in line with broad reforms being undertaken elsewhere in the economy, such as the export-import, banking sector and financial reforms.

Although capital inflows should at least in theory contribute to faster growth (especially in developing countries) through more efficient resource allocation, enhanced domestic savings, and transfer of technological or managerial know-how, evidence is inconclusive. The inconclusiveness of these studies may be due to a fundamental misspecification of the way they test the benefits of capital account openness. It may also be probable that growth enhancing effects of openness are a one-time event (such as a permanent increase in the level of GDP) that follows capital account liberalization in a given country, rather than a permanent feature across countries. However, in order to understand these linkages, more country specific time series studies are needed. And the use of the advanced methods requires long period data sets preferably quarterly data. The present study is an attempt in this direction.

III Capital Account Openness: the Indian Experience

In this section, we have made an attempt to review the Indian experience of capital account openness in terms of partial capital account convertibility and its impact on capital flows, economic growth, exchange rates and trade balances (see picture-1). The movement of these variables for the period (1990--2013) is presented in table-1.

Picture 1: GDP, Capital Flows, REER and Trade Balances of India



During the period of capital account convertibility (CAC) there is a positive growth in all the macro economic variables studied. Along with growth the variability has also increased. Both FDI and FPI have registered positive growth rates (5.36% and 8.5% respectively) but along with this the variability also has increased. As expected, FPI is more volatile (1.30%) than FDI flows (0.82%) in India. From 1990-91 onwards, both exports and imports grew at an accelerated pace (3.20% and 3.45% respectively) in response to the introduction of full convertibility in the current account (100% drawdown of foreign exchange was allowed). The growth rates were computed using exponential functional form for the quarterly data (1990-91 to 2011-12) and the estimated values of the function are used to compute the variability in growth. While trade volumes improved significantly, the contrary is true about export- import ratio. The X/M ratio declined during the period since imports grew faster than exports as better availability of foreign exchange resources consequent to higher exports improved India's capacity to import more. Its inelastic oil imports also have contributed to the higher import bill.

The success with full current account convertibility had its ramifications beyond the immediate phase of trade liberalization and continues till date. The table, which also highlights the composition of India's trade till 2012-13 show a significant surge in trade as evidenced from exports and import volumes. The X/M ratio, predictably, deteriorated due to higher import dependency while the 2008 global financial crisis and the Euro

Zone crisis dragged down exports. However, it is pertinent to note that exports and imports grew at a CAGR of 18.85% and 21.40% respectively post 2000, higher than during the 1990s. This is further testimony that full current account convertibility improved exports and imports volumes. To a great extent, partial convertibility in capital account also contributed to enhanced trade volumes by increasing productivity.

The deterioration in exports relative to imports has been significant in the last couple of years and seems to have been affected, *inter alia*, by the resurgence in international crude oil prices. However, given strong growth in exports in absolute terms, the income terms of trade, which measure the import purchasing power of exports, consistently improved since the 90s. This reflects growing competitiveness of Indian exports. On the exchange rate front, the trade weighted REER and NEER is used for the study. It is seen from the Table that during the post liberalization phase 1990-91 to 1993-94, the REER and the NEER has been on a depreciating trend. The REER and NEER depreciated from 75.58 and 67.20 during 1990-91 to 61.59 and 44.69 by 1993-94. This is logical since partial as well as full rupee convertibility in the current account was ushered in during this period, leading to greater trade ties and imports. This widened our trade deficit due to import dependency and consequent current account deficit.

From 1994-95 onwards, though the pattern is not quite uniform on a yearly basis, there is actually a depreciation for both REER and NEER to 95.99 and 91.02 respectively by 1999-2000. Since base year was changed to 1993-94 and assigned a value of 100, we argue that this is depreciation. The depreciating trend since 1994-95 is due to greater trade and financial integration with the rest of the world, which widened our trade balance. The base year was again changed to 2004-05. From 2005-06, however, the pace of depreciation has not shown a consistent pattern. There was a sharp appreciation during 2006-07 in both Real and Nominal Effective Exchange Rates due to enhanced capital flows to India on account of recession in western countries and also to take advantage of positive interest rate differentials. However, this appreciation of the REER and NEER reversed during 2008-09 since more rupee funds were injected into the system due to stimulus packages by the Government. However, there was again a sharp appreciation during 2010-11 due to high growth rate attained by the Indian economy which attracted capital flows only to be once again reversed during 2011-12 due to Euro crisis while trade deficit and current account deficit continued to widen.

Table 1: Trade Balance, Capital flows & Nominal GDP

Year	Trade balance (US\$ billion)	Nominal GDP (US\$ billion)	Trade balance to nominal GDP	REER-Trade weighted	NEER trade weighted	Net capital flows	Net capital flows to nominal GDP
1990-91	-9.44	258.37	-3.65	75.58	67.20	7.20	2.79
1991-92	-2.79	259.98	-1.07	64.20	52.51	3.78	1.45
1992-93	-4.06	258.37	-1.57	65.14	49.30	2.94	1.14
1993-94	-9.05	259.98	-3.48	100.13*	99.97	9.69	3.73
1994-95	-11.36	246.33	-4.61	104.59	99.21	9.16	3.72
1995-96	-14.82	284.10	-5.22	98.42	91.65	4.69	1.65
1996-97	-15.51	322.52	-4.81	96.64	89.08	11.41	3.54
1997-98	-13.25	346.26	-3.83	100.95	92.17	10.01	2.89
1998-99	-17.84	390.78	-4.57	92.84	88.76	8.26	2.11
1999-00	-12.46	450.18	-2.77	95.75	90.90	11.10	2.47
2000-01	-11.57	476.67	-2.43	100.04	92.11	8.53	1.79
2001-02	-10.69	493.99	-2.16	100.87	91.52	8.38	1.70
2002-03	-13.72	524.14	-2.62	98.19	89.22	10.64	2.03
2003-04	-33.70	618.39	-5.45	99.50	87.15	17.34	2.80
2004-05	-51.90	721.61	-7.19	100.01*	100.00	28.63	3.97
2005-06	-61.78	834.28	-7.41	103.09	102.24	24.95	2.99
2006-07	-91.47	948.48	-9.64	101.22	97.63	46.17	4.87
2007-08	-119.52	1239.30	-9.64	108.54	104.75	107.90	8.71
2008-09	-118.20	1226.10	-9.64	98.08	93.34	7.84	0.64
2009-10	-130.59	1366.10	-9.56	95.67	90.94	51.62	3.78
2010-11	-189.76	1710.30	-11.10	103.93	93.54	59.00	3.45
2011-12	-191.50	1872.90	-10.22	101.38	87.38	67.76	3.62
2012-13	-190.91	1857.36	-10.28	94.61	78.32	89.29	4.81
Trend growth rate	-	11.02	-	-	-	13.69	-

Note; growth rates are computed using semi-logarithmic trend model. *refers to 1993-94 and, ** refers to 2004-05 as the base year respectively.

Source: Handbook of Statistics, RBI

As a simple measure of openness of the economy, we may consider the ratio of net capital flows to nominal GDP. The above data shows that ratio of net capital flows to nominal GDP did not show a consistent picture during 1990-91 to 1996-97. Though net capital flows were on a rising trend during the period, nominal GDP did not show a consistent growth which led to volatility in the ratio. Net capital flows however, grew at a compounded rate of 8.14% during the period. Our capital market reforms barely started during this period with the abolition of the Controller of Capital Issues and establishment of the Securities & Exchange Board of India (SEBI) and hence, non-improvement in the ratio of capital flows to GDP during this period is quite logical.

Table 2: Trends in FDI and FII Flows

Year	Net FDI (US \$bn)	Net FII (US \$ bn)	Net Foreign Investment
1990-91	0.10	0.01	0.11
1991-92	0.13	0.00	0.13
1992-93	0.32	0.24	0.56
1993-94	0.59	0.36	0.85
1994-95	1.31	3.82	5.14
1995-96	2.14	2.75	4.89
1996-97	2.82	3.31	6.13
1997-98	3.56	1.83	5.39
1998-99	2.46	-0.06	2.41
1999-00	2.16	3.03	5.19
2000-01	3.28	2.59	5.86
2001-02	4.73	1.95	6.69
2002-03	3.15	0.94	4.16
2003-04	2.39	11.38	14.78
2004-05	3.71	9.29	13.00
2005-06	3.03	12.49	15.53
2006-07	7.69	6.95	15.54
2007-08	15.89	27.43	44.81
2008-09	22.34	-14.03	8.34
2009-10	17.96	32.40	50.36
2010-11	11.30	30.29	41.59
2011-12	22.00	17.17	39.17
2012-13	19.80	26.90	46.70

Source: Handbook of Statistics, RBI

Partial capital account convertibility was introduced during 1996-97 after the recommendations of Tarapore Committee. It is seen from the above Table that capital flows in absolute terms improved after partial convertibility in the capital account. The compounded growth rate during 1997-98 to 2012-13 has been 16.55% while it was only 8.14% during 1990-91 to 1996-97. The rate of growth of net capital flows (16.55%) was higher than nominal GDP (12.77%) after the introduction of partial capital account convertibility. Net Capital flows reached a peak at \$ 108 billion during 2007-08 and thereafter slowed due to the global financial crisis and increased again from 2009-10 onwards. It is also seen that as a proportion to GDP, net capital flows registered an improvement from 2.89% during 1997-98 to 4.81% by the end of 2013. However, from 2009-10, there is a consistent trend. While components such as ECBs were the major sources of capital flows before partial capital account convertibility, FDI and FII flows revolutionized capital account management in India and facilitated a quantum jump in capital flows.

However, even now, capital flows do not constitute 5% of gross domestic product. This is due to the restrictions imposed on various sectors as far as FDI and FII flows are

concerned. In the interim period of 2008-09, there was a drastic reversal of capital flows due to the global financial crisis which revived from 2009-10 onwards. Since then, there has been a steady rise in capital flows. However, from a miniscule 1% of GDP during the initial years of liberalization, the share of net capital flows to GDP increased almost five fold to 4.8% by the end of 2013. This is due to partial convertibility in the capital account which increased the extent of our financial integration with the rest of the world. Capital flows contribute towards filling the resource gap where the domestic savings are inadequate to finance investment. While FII flows towards debt and equity segments contribute significantly towards this aim, it is extremely important to increase our dependence on stable FDI flows, which, apart from ensuring BoP stability, also brings productivity improvements. If the ratio of capital flows to GDP is considered as a measure of convertibility, the measure shows a rising trend. In other words, partial capital account convertibility had a positive impact on Gross Domestic Product.

IV Data Sources and Econometric Model

In this section, an attempt is made to study the linkages between capital flows and the variables such as Index of Industrial production (IIP), Real Effective Exchange Rate (REER) and the trade balances (BOT). While analyzing the relation between capital flows and growth, Index of Industrial production (IIP) is taken as a proxy for real GDP and the capital account openness is proxied by capital inflows. The exchange rate considered is the quarterly REER sourced from RBI website. The choice of IIP is dictated by the fact that capital inflows are mainly absorbed in the industrial or manufacturing sector and is comparatively easier to measure. The trade balances are measured as a ratio of value of exports to imports. The data are collected on quarterly basis from RBI and Central Statistical organization (CSO) of India. All the variables in dollar terms are converted to their natural logarithms. The prefix 'L' stands for the natural logarithm of the respective series and 'D' denotes the first differences of the respective time series. In order to pre-empt the possibility of running spurious regressions, the time series properties of variables used in the analysis were tested. The time series uni-variate properties are examined using ADF (Augmented Dickey-Fuller) test. The following Table shows the results of ADF test for the variables considered in the model.

Table 3: ADF Unit Root Test

Variable	Levels	Prob	First Difference	Prob
LCF	-2.63495	0.2661	-13.47475*	0.0001
LIIP	-3.51600	0.0647	-28.85081*	0.0001
LREER	-1.77106	0.7092	-4,105,854*	0.0017
LBOT	-2.06855	0.5551	-9.307885*	0.0000

*Note: * Significant at 0.01 levels. ADF test includes intercept and slope for variables in levels while for the variables in first difference the intercept is included. Lag length has been chosen based on Schwartz criteria. ADF values are compared with Mc Kinnon critical values.*

Once ADF test has strongly rejected unit roots, the second stage in the empirical analysis is the computation of co integration test. Two or more variables are said to be co integrated if they share common trends i.e. they have long run equilibrium relationships. According to Engel and Granger (1987), if a set of non-stationary variables are co-integrated then it follows that the variables will come back to equilibrium in the long run. The co integration test has been conducted using Johansen's Co integration test. The equation estimated is as follows:

$$LIIP = \beta_0 + \beta_1 LCF + \beta_2 LER + \beta_3 LBOT + \varepsilon_t$$

Where LIIP, LCF, LBOT, LER denotes index of industrial production, capital flow, trade balance and real effective exchange rate respectively. The results of Johansen's co integration test are summarized in the table below:

Table 4: Johansen Co integration: Trace Test

Sample (adjusted): 1990Q4 2012Q4 Included observations: 89 after adjustments Trend assumption: Linear deterministic trend Series: LIIP LCF LBOT LER Lags interval (in first differences): 1 to 2 Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.309952	60.79195	47.85613	0.0019
At most 1	0.192130	27.77343	29.79707	0.0841
At most 2	0.082896	8.784866	15.49471	0.3857
At most 3	0.012098	1.083296	3.841466	0.2980

Note: Trace 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

Table 5: Johansen Co integration: Maximum Eigen Vector Test

Sample (adjusted): 1990Q4 2012Q4 Included observations: 89 after adjustments Trend assumption: Linear deterministic trend Series: LIIP LCF LBOT LER Lags interval (in first differences): 1 to 2 Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.309952	33.01852	27.58434	0.0090
At most 1	0.192130	18.98857	21.13162	0.0972
At most 2	0.082896	7.701570	14.26460	0.4099
At most 3	0.012098	1.083296	3.841466	0.2980

Note: 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 Trace and Maximum Eigen value tests indicate that the variables are co integrated at 0.05 significance level. Thus, co-integration tests establish the existence of long run equilibrium among these variables. The normalized cointegrating equation estimated is as follows:

Table 6: Normalized Cointegrating Equation

$$\text{LIIP} = 0.324934 \text{ LCF}^* + 2.824871 \text{ LER}^* + 0.584058 \text{ LBOT}^*$$

(0.038) (0.424) (0.234)

*Note: Figures in the parentheses are standard errors and * indicates significance at 5% level*

However, to establish the linkages between these variables the short run dynamics of the variables need to be verified. For this purpose Vector Error Correction Models are estimated in the VAR framework. The results are summarized as follows:

Table 7: VECM Model

Dependent Variable: D(LIIP)

Method: Least Squares

Sample: 1990Q4 2012Q4

Included observations: 89 after adjustments

$$\begin{aligned} \text{D(LIIP)} = & \text{C(1)} * (\text{LIIP}(-1) - 0.884255394304 * \text{LCF}(-1) - \\ & 7.45109717232 * \text{LBOT}(-1) - 2.48876644691 * \text{LER}(-1) - \\ & 0.465187234688) + \text{C(2)} * \text{D(LIIP}(-1)) + \text{C(3)} * \text{D(LIIP}(-2)) + \text{C(4)} \\ & * \text{D(LCF}(-1)) + \text{C(5)} * \text{D(LCF}(-2)) + \text{C(6)} * \text{D(LBOT}(-1)) + \text{C(7)} * \text{D(LBOT}(-2)) \\ & + \text{C(8)} * \text{D(LER}(-1)) + \text{C(9)} * \text{D(LER}(-2)) + \text{C(10)} \end{aligned}$$

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)*	-0.009638	0.003636	-2.528328	0.0213
C(2)*	-0.252065	0.110805	-2.274865	0.0256
C(3)*	-0.266725	0.115544	-2.308429	0.0236
C(4)	-0.026994	0.033453	-0.806929	0.4221
C(5)	0.018008	0.033049	0.544872	0.5874
C(6)**	-0.160012	0.085939	-1.861931	0.0663
C(7)*	-0.147912	0.071611	-2.065484	0.0422
C(8)	-0.091819	0.217810	-0.421554	0.6745
C(9)**	-0.431630	0.230477	-1.872765	0.0648
C(10)*	0.032158	0.007562	4.252451	0.0001
R-squared	0.193082	Mean dependent var	0.020574	
Adjusted R-squared	0.101154	S.D. dependent var	0.064424	
S.E. of regression	0.061079	Akaike info criterion	-2.647770	
Sum squared resid	0.294720	Schwarz criterion	-2.368148	
Log likelihood	127.8258	Hannan-Quinn criter.	-2.535063	
F-statistic	2.100374	Durbin-Watson stat	2.041520	
Prob(F-statistic)	0.039109			

*Note: * and ** indicates significance at 5% and 10% respectively.*

Table 8: Impact of Capital Flows on IIP: Wald Test

Test Statistic	Value	df	Probability
F-statistic**	2.784781	(2, 79)	0.0697
Chi-square	5.569562	2	0.0562

Note: ** indicates significance at 10% level.

Table 9: Impact of Trade Balances on IIP: Wald Test

Test Statistic	Value	df	Probability
F-statistic**	2.534937	(2, 79)	0.0857
Chi-square	5.069873	2	0.0793

Note: ** indicates significance at 10% level.

Table 10: Impact of REER on IIP: Wald Test

Test Statistic	Value	df	Probability
F-statistic	1.846816	(2, 79)	0.1645
Chi-square	3.693631	2	0.1577

Table 11: Impact of IIP on Capital Flows: Wald Test

Test Statistic	Value	df	Probability
F-statistic*	2.560187	(2, 79)	0.05238
Chi-square	3.920374	2	0.02322

Note: * indicates significance at 5% level

Table 12: Impact of IIP on Trade Balances: Wald Test

Test Statistic	Value	df	Probability
F-statistic*	4.461445	(2, 79)	0.0146
Chi-square	8.922890	2	0.0115

Note: * indicates significance at 5% level

Table 13: Impact of IIP on REER: Wald Test

Test Statistic	Value	df	Probability
F-statistic**	2.677672	(2, 79)	0.0750
Chi-square	5.355345	2	0.0687

Note: ** indicates significance at 10% level.

V Conclusion and Policy Suggestions

In this paper, we have examined the impact of capital flows along with other macro variables such as trade balances and exchange rate on economic growth of India for the post liberalization period (1990-2013). Existing empirical studies on the impact of capital account openness have presented mixed and inconclusive evidence. We have employed time series methods to study the long run relationship between economic growth and capital flows along with REER and trade balances. Based on our empirical analysis the following conclusions and policy interventions may be made:

1. During the period of capital account convertibility (CAC) of India, there has been a positive growth in all the macro economic variables studied. Both FDI and FPI have registered positive growth rates but along with the variability also increased. As expected, FPI is more volatile than FDI flows in India. This is understandable due to the short term nature of portfolio investments. However, to curtail this and to allow the smooth flows, the issues relating inflation, interest rates and corruption have to be addressed immediately.

2. Exports and imports grew at an accelerated pace in response to the introduction of full convertibility in the current account (100% drawdown of foreign exchange was allowed). While trade volumes have increased significantly, the export- import ratio (X/M) declined since imports grew faster than exports due to the availability of foreign exchange resources consequent to higher exports. The inelastic nature of oil imports also had contributed to the higher import bill.

3. In this paper, apart from analyzing the impact of capital account openness on growth from a macro perspective, the impact of major macro variables on growth such as capital flows, trade balances and exchange rate on the Index of Industrial Production (IIP) is attempted. The following results emerge from the econometric analyses using Johansen Co-integration and VEC methods: There exists a long run relationship between the variables such as IIP, capital flows, trade balances and REER. This indicates the importance of capital flows, trade balances and exchange rates in influencing the economic growth of India in the long run. Hence continuing with capital account liberalization, trade liberalization with an emphasis on promoting exports and allowing exchange rates to reflect the market changes should be continued in India. However, caution should be taken to see that these policies should not result in volatility in capital flows, exchange rates and at the same in volatility in trade volumes as the volatility leads to uncertainty and therefore decline in growth.

4. The empirical results also suggest that there is bilateral short run causality running between capital flows and IIP; and between trade balances and IIP. This clearly demonstrates the importance of inflows of capital and trade balances in impacting economic growth in the short run. Hence, the inflow of foreign capital should be

encouraged as it positively influences the economic growth of the country. The gradual Liberalization of FDI flows in to the economy should be continued and extended to the in other sectors such as education, insurance, defense, etc. The recent policy pronouncements of hiking FDI cap in insurance and defense industries is highly laudable. The present conducive environment of political stability, good governance would go a long way in attracting capital flows in to the economy.

5.IIP appears to cause exchange rates in the short run as well but converse was not found true. Exchange rates do have long run association with economic growth but in the short run they have not impacted economic growth. Therefore the country should continue with the existing exchange rate policies and do not excessively worry about short run fluctuations in exchange rates.

6. India needs to open more its economy to international trade and capital flows to reap the benefits of global integration by diversifying its exports, export markets and attracting more capital inflows mainly in the form of FDI from different destinations. Trade, exchange rate, industrial and infrastructure policies should be integrated with the aim to improve productivity, competitiveness, efficiency and employment to the local people.

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