The Determinants of Foreign Direct Investment in India*

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India has implemented far-reaching economic reforms since it adopted a market-oriented open door policy in 1991. The current paper examines how changes in the macroeconomic condition have influenced inward FDI in India. The empirical evidence derived through vector error correction estimations show all three macroeconomic variables—national income, wage, and tariff rates—form a statistically significant and stable long-run equilibrium relationship with FDI inflows. FDI inflows are revealed to be positively related to market size. In contrast, wage levels and tariff rates have negative effects on FDI inflows, implying that less protection stimulates more FDI in India. Finally, albeit the existence of a structural break in the model between 1992 and 1993, the influence of economic reform on FDI inducement was not statistically significant.

Keywords: FDI determinants, economic reform, structural break

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I. INTRODUCTION

Increased trade values and foreign direct investment (FDI) flows characterize the age of globalization. Integration to the world economy is considered an efficient way to promote economic growth and to improve the overall income level of a country. Many developing countries have experienced rapid economic growth and global integration since they adopted a market oriented open door policy. Due to aggressive approaches towards globalization taken by the developing countries, the global map of FDI distribution has been changing.

In the past, FDI inflows were concentrated primarily amongst developed countries. However, in recent years, around 40% of the flows have been towards developing countries (UNCTAD 2006). For capital-scarce developing economies, FDI implies access to not only capital, but also to advanced technology and know-how, managerial expertise, global marketing networks and best-practice systems of corporate governance. Furthermore, as FDI inflows are non-debt creating and more stable than portfolio flows, FDI has been highly longed-for by countries that have experienced a foreign exchange crisis, such as India. For those reasons, following the withdrawal of most restrictions on cross-border movement of capital in a globalized world, almost all developing countries have adopted liberal policies towards FDI for exploiting the virtuous aspects of such flows.

In spite of enabling policies, however, success in attracting FDI has varied widely between countries. Such success is also seen to have varied over time. In recent years, India has emerged as one of the leading FDI destinations in Asia. During 2006-2007, FDI inflows into India were more than double than those in 2005-2006. Indeed, during April-January 2006-2007, inward FDI into India at US$16.4 billion was far higher than the annual average inflow of US$2-3 billion during the late 1990s.

Empirical research on FDI in India has mostly focused on the impact of FDI upon macroeconomic fundamentals. But with India emerging as a leading recipient of FDI in developing Asia in recent years, a close look at the likely determinants on FDI inflows becomes imperative. The limited literature on host-country determinants of FDI inflows into India argues that such FDI is either essentially domestic market-oriented or factor-oriented, attracted mostly by India's low wage labor.

In this context, this paper attempts to study the main determinants of inward FDI into India focusing on macroeconomic fundamentals-GNI, wage, and tariff rate. While all these factors can influence inward FDI, it is important to determine which of these are more significant in explaining India's ability to consistently attract more FDI over time. In this vein, the main contributions of this study can be the following: First, to determine the existence of a stationary long-run relationship among FDI, national income, wage and tariff rate and weak exogeneity of all variables. Second, to find out the short-run dynamic and causal relationship
between FDI and the other explanatory variables-national income, wage and tariff rate. Third, to find some support to the proposition that the inward FDI in India has changed in the post-reform period, though possibly not to the extent proponents of a further liberalization of FDI regulations might implicitly assume.

The rest of the paper is organized as follows. Section II describes the evolution of FDI policy of the Indian government and some stylized facts regarding FDI inflows to India since 1950s to the most recent years. A brief introduction of the theoretical framework for the determinants of FDI will follow and lead to the econometric estimation in Section III. Section IV presents the model and data to examine the impact of macroeconomic variables on determining inward FDI in India. Section V reports the main empirical evidences found in this research. Some concluding remarks are provided in the last section.

II. EVOLUTION OF FDI POLICY AND TRENDS OF FDI IN INDIA

India, turning inwards after its independence in 1947, handicapped the private inducement to invest by imposing exchange controls and pursuing an import substitution strategy. However, suffering from the 'Hindu growth rate' of 3.00 to 3.5 percent, and more directly, hit by a full-blown macroeconomic crisis in 1991, India embarked on a new development strategy and introduced policies designed to improve its growth prospects and increase its integration into the global economy (Bhagwati 1998). Major reforms included opening up more sectors to private investment, encouraging foreign direct investment, reducing red tape, further liberalizing trade and exchange rate regime and reforming capital markets, and so forth. All these efforts led to an improved investment climate in India.

And again in 2002, faced with a continued low inflow of foreign direct investments, the government identified a complex policy framework. The government tried to renovate both FDI policy and domestic policy-procedure, quality of infrastructure, delay in investment implementation due to state level policies and legal delays as major obstacles for lack of low FDI inflow. Since then the government has simplified the rules for foreign investments and relaxed the ownership rules for foreign investors in most of the sectors including the manufacturing sector.

At present there are two routes to invest in India. The first one known as 'automatic route', where no prior approval is required and the investors just have to inform the Reserve Bank of India (RBI) within 30 days of the flow of investments. Most sectors, including manufacturing activities, permit 100% FDI under automatic route. The second is through prior approval from 'Foreign investment promotion board (FIPB)' in cases of investment in restricted activities.
such as investment in excess of 24% in small scale units, and so forth. Retail trading, Atomic energy, Lottery business and Gambling are still prohibited from foreign investments. Companies incorporated in India are treated as Indian companies for taxation. But all investments are on repatriation basis of original investment from which profits and dividends can be freely repatriated.

**FIGURE. ECONOMIC GROWTH OF INDIA AND ITS INWARD FDI (1970-2003)**

Backed up by assiduous government efforts and rapid economic growth, FDI has boomed in post-reform India. The stock of FDI in India soared from less than US$ 2 billion in 1991, when the country undertook major reforms to open up the economy to world markets, to almost US$ 39 billion in 2004. Annual average inflows of US$ 200 million in 1987-1990 pale in comparison with annual average inflows of US$ 4.1 billion in 2001-2004 (UNCTAD online database). Indeed, during April-January 2006-2007, inward FDI into India at US$16.4 billion was far higher than the annual average inflow of US$2-3 billion during the late 1990s. During 2006-2007, FDI inflows into India were more than double those in 2005-2006.

FDI has gained prominence in relative terms, too. FDI inflows accounted for 3.2 percent of gross fixed capital formation in 2001-2004. Compared with all developing countries (10.5 percent in 2004) and China (14.9 percent in 2004), this share is still low. However, in the pre-reform period of 1987-1990, FDI inflows accounted for just 0.3 percent of gross fixed capital formation in India. Inward FDI stocks, relative to GDP, soared from less than one percent in the late 1980s and early 1990s to almost 6 percent in 2004.
III. PREVIOUS EMPIRICAL RESEARCH ON THE DETERMINANTS OF FDI

A large number of literatures on the determinants of FDI examine how exogenous macroeconomic factors affect the location decision of multinational companies (MNCs) with the primary focus on exchange rate movements, taxes, and to a more limited extent, tariffs. But since Helpman (1984), theories have suggested two very distinct motivations for FDI: access to markets in the face of trade friction (market-seeking or horizontal FDI) or access to low wages for part of the production process (efficiency-seeking or vertical FDI). More recently, a number of papers have begun to sketch out more complicated patterns of FDI. For example, an important possibility is export platform FDI where a MNC places FDI into a host country to serve as a production platform for exports to a group of (neighboring) host countries (Blonigen 2005).

Globalization has resulted in increasing fragmentation of production networks of multinational enterprises. Several functions, which used to be performed earlier in one location are now getting dispersed over multiple countries to maximize the benefits offered by specific features of different locations. Such fragmentation implies that countries are likely to fall behind in the race of attracting FDI, unless they strengthen their comparative advantages.

Most literature on FDI tries to explain cross-country variations in FDI inflows in terms of country-specific features encouraging or discouraging such flows. These can be broadly classified into economic factors impacting returns from investment (for example, host country’s market size, availability and cost of skilled labor, exchange rate stability, availability of natural resources, infrastructure), host country policies (for instance, outward-orientation, tax rates, investment incentives) and institutional factors influencing investor outlooks (such as, political stability, ease of doing business, cultural differences from home countries and language). While all these factors, individually and collectively influence inward FDI, it is important to determine which of these are more significant in explaining the ability of some economies to consistently attract more FDI over time.

Empirical study by Broadman and Sun (1997) conducted cross-sectional analysis on the distribution of FDI in China using data of accumulated stock of FDI in each province and autonomous regions at year-end 1992. The study used five explanatory variables, namely gross national product, labor costs, human capital, infrastructure and geographical location. Like many empirical works on this subject, the study showed that the pattern of FDI within China has been skewed towards coastal location.

Most cases are based on cross country data only. But this may lead to an omitted variable bias in the empirical specification and cause difficulty in showing a long-run relationship, which may be of particular concern to the cross-sectional regression analysis. In this context, empirical research to identify a long-term
relationship as well as a short-term relationship between/among the variables with time series data of developing countries can contribute to those previous empirical studies on determinants of FDI.

While empirical research on FDI in India has mostly focused on host-country determinants of FDI, inflows into India point out that such FDI is essentially domestic market-oriented or aims to enjoy the advantage of low wage costs. In addition to big market size and low waged skilled labor, using panel regression techniques, Palit and Nawani (2007) found the levels of technology and human capital also stimulate foreign investment in India.

IV. THE METHODOLOGY AND DATA

The thrust of this paper is on identification of major macroeconomic determinants that have enabled India to emerge as one of the attractive destinations for FDI in recent years. Inward FDI is influenced by a host of economic, policy and institutional factors, as identified by both theoretical and empirical literature. Several variables should be incorporated as controls to identify macroeconomic determinants, including market size, wage costs, and trade protection mechanism.

Given this objective, the model should be constructed to recognize possible links among FDI inflows into India and national income, wage and tariff rates. Moreover, we seek causality relationships between FDI, national income, wage and tariff rate variables from the dynamic reaction per system to alterations in the control variables based on a systematic approach. If economic variables were known to be I(1) with one cointegrating vector, then the conventional asymptotic theory is a valid for hypothesis testing in restricted VAR with difference and error correction model (Maddala 1998). Thus, the vector error correction model (VECM) for four endogenous variables in level and \( p \) lags in each variable can be expressed as follows:

\[
\Delta Y_t = \Phi_1 + \sum_{j=1}^{p} \Delta X_{t-j} \theta + \lambda \kappa_{t-1} + \epsilon_t
\]

where \( X \) is a vector of independent variables, \( \kappa_{t-1} \) is an error correction term derived from the long-run cointegrating equation, and \( \Delta \) is the first difference operator. The term \( \epsilon_t \) represents random errors with zero mean and finite variance.

The underlying theoretical assumption is that the relationship between the variables in the model resembles a moving equilibrium in which the dependent variable may not only fluctuate in response to short-run changes in the independent variables but also assume levels consistent with those of the independent variables over the long run. The central advantage of the model is thus that it makes it possible to distinguish between the short-and long-term relationship of \( X \)
The former relationship is captured by $\theta$ and the latter by $\lambda$ on the basis of the error correction term presented here as $K_{t-1}$.

The justification for this approach is that the identification and testing for the significance of the structural coefficients in the theoretical relationships is important. The simple VAR models do not identify structural coefficients nor do they take seriously the relevance of unit root tests. VECM treats all variables as endogenous, like VAR, but limits the number of variables to those relevant for a particular theory or model (Rao 2007). Since the theories introduced in the previous section imply that FDI inflow depends on the national income (GNI), wage (WAGE), and tariff barrier (CUSTD), these four variables form a system. According to VECM the assumption that FDI is the dependent variable and GNI, WAGE and CUSTD are independent explanatory variables needs to be tested. It start with the test for the stationarity of the relevant variables with the unit root tests to verify that each variable is $I(1)$ and their first difference is $I(0)$. If the levels of these variables move together, as the underlying theories imply, then they should be cointegrated. As we know, two time series are co-integrated if there is a long-run relationship between them. If we want to take this long-run effect into account, an error-correcting term has to be included in the model. This allows the separation of short-run from long-run causality.

Moreover, the Chow test to examine the presence of a structural break can be practiced as it can be assumed that India's economy has been subjected to wide-range post-reform change since 1991.

Accordingly, the following equation is specified with the independent variables expressed as vector $X$ in the previous equation:

\[
\Delta FDI_t = \Phi_1 + \sum_{i=1}^{p} \Delta FDI_{t-i} \cdot \theta + \sum_{i=1}^{p} \Delta GNI_{t-i} \cdot \theta + \sum_{i=1}^{p} \Delta WAGE_{t-i} \cdot \theta \\
+ \sum_{i=1}^{p} \Delta CUSTD_{t-i} \cdot \theta + \lambda K_{t-1} + \varepsilon_t
\]

in which FDI denotes foreign direct investment flow into India. GNI denotes India's real gross national income in constant U.S. dollars; WAGE is the average monthly wage of manufacturing workers in India; CUSTD is defined as the tax revenue collected by the Indian government from customs duties divided by import value. FDI, national income and wage data are taken from the World Development Indicators (2006), while data for tax revenue and customs duties are employed from the budget documents of the Government of India and finance accounts (various issues) issued by the Reserve Bank of India.

The expected relationships of different independent variables with the dependent variable are indicated as following. FDI inflows are expected to be positively
related to market size implying that larger markets should attract more FDI. The empirical literature on determinants of FDI has emphasized the size of the host country market as a key factor in influencing inward FDI (Abdur and Mavrotas 2005; Chakraborty and Nunnencamp 2006; Palit and Nawani 2007). Thus large domestic markets are expected to encourage FDI of the ‘market-seeking’ type primarily on account of positive externalities from economies of scale.8

The standard hypothesis holds that lower relative wage costs will encourage ‘efficiency-seeking’ FDI flows. But results are different from developing to developed countries. While some empirical studies indicate that wage differentials are not a significant determinant for industrial countries, recent results for developing countries seem to indicate that relative wage costs are a significant determinant of FDI flows (Singh and Jun 1995; World Bank 2006). As a labor abundant developing country, the wage level of India is expected to be negatively related to inward foreign investment.

CUSTD is used as a proxy variable for the tariff rate. The hypothesized link between FDI and trade protection is seen as fairly clear by most trade economists. In other words, higher trade protection should make firms more likely to substitute affiliate production for exports to avoid the costs of trade production. This is commonly termed “tariff-jumping FDI.” Early literature on FDI had stressed high tariff walls as a common factor for motivating tariff-jumping FDI. More recent empirical research, however, indicates that more open economies in terms of lower tariffs, fewer trade barriers, and overall greater economic linkages with the rest of the world, are likely to attract more FDI (Singh and Jun, 1995; Chakraborti, 2001). This FDI is expected to be essentially export-oriented and hence efficiency-seeking or vertical in nature.9

V. EMPIRICAL EVIDENCES

The Augmented Dickey Fuller (ADF) test for stationarity, carried out at level and first differencing, shows all the variables are not stationary Table 1. Although not stationary, all the variables-FDI, GNI, WAGE, CUSTD-are integrated of order one, i.e., their first differenced forms are stationary.

Having confirmed the existence of unit roots for all time series, we employ Engle-Granger’s two-step cointegration test to examine whether there exists a long-run relationship among the variables. The null hypothesis that there does not exist any cointegrating vector among FDI, GNI, WAGE and CUSTD is rejected. The result indicates that the dependent variable FDI and all the explanatory variables-GNI, WAGE, CUSTD-have long run equilibrium relationships among them and the explanatory variables may contribute to locating India as an attractive FDI destination.
TABLE 1. UNIT ROOT TEST RESULTS

| Variables | Level form | First-differenced form |
|-----------|------------|------------------------|
| FDI       | -0.700     | -5.177**               |
| GNI       | 2.044      | -2.989*                |
| WAGE      | -1.091     | -6.580**               |
| CUSTD     | -1.032     | -4.139**               |

Note: * and ** statistically significant at 10 percent and 5 percent level of significance respectively.

We have verified that the variables are cointegrated. Furthermore, as the cointegration vector is only the long-run relationship of FDI and the independent variables, we need a short-run dynamic equation based on the error correction model approach. A restricted VAR model, which employs all four variables in first difference, can be applied.

Table 2 presents the results of vector error correction estimates. The empirical results of the original equation are presented in the row Model 1 in Table 2. All the adjustment coefficients are statistically significant and have correct signs, fortifying the existence of stable long-run relationship. According to the estimates of the normalized cointegrating vector, the GNI variable has a statistically significant positive effect on the FDI inflow. The WAGE and CUSTD variables have significantly negative effect on the FDI inflow. Thus, the co-movement among the relevant time series confirms that a long-run equilibrium relationship exists.

TABLE 2. ESTIMATION RESULTS BASED ON THE VECTOR ERROR CORRECTION ESTIMATES

| RHS Variables | Model 1 | Model 2 |
|---------------|---------|---------|
| CONSTANT      | 0.025^a | 0.019^a |
| GNI           | 0.008*** (6.516) | 0.010*** (12.006) |
| WAGE          | -3.771^b*** (-4.523) | -2.947^b*** (-5.850) |
| CUSTD         | -5.106^b*** (-3.607) | -5.763^b*** (-8.539) |
| DUM           | -0.200  (0.448)   |          |
| Adjustment coefficients of the output vector | -0.601** (-3.252) | -0.752** (-2.332) |

Adjusted $R^2$ | 0.364 | 0.400 |
Number of observations (after adjustments) | 31 | 31 |

Note: 1. Coefficient values with ^a are multiplied by $10^1$ and with ^b are divided by $10^1$.
2. Values within the parentheses denote the t-statistics.
3. ** and *** denote significance at 5 and 1 percent respectively.

The positive and statistically highly significant coefficient of GNI indicates that FDI increases with the size of the India's domestic market. Also the coefficient of WAGE is consistent with the expectation that an increase in wage level would deteriorate the motives of foreign investors who seek for low labor cost.
Among these significant effects, the sign of the CUSTD is not consonant with theoretical expectation. We infer the in consonant result refutes the tariff-jumping argument in India's case by showing that decrease in tariff barriers does not encourage further FDI in India. This rational is supported by recent studies by Singh and Jun (1995) or Chakraborti (2001). Therefore, the results show that FDI in India is export-oriented in nature.

The results of the Chow tests show that the calculated F-statistics exceed critical value when the data are divided between 1970-1992 and 1993-2003 in taking account the effect of India's economic reform. Therefore, in Model 2, a year dummy variable was included in the original Model 1 as it proved that India's FDI has undergone structural change after economic reforms in 1991. As shown in the table above, however, there is no statistically significant evidence in the estimation results that economic reform influenced inward FDI in India. And the overall results do not change whether or not year dummy is included in calculating the amount of FDI inflow. But the results show an even stronger negative relationship between CUSTD and FDI. Moreover, by adding a dummy variable as an exogenous variable in the original equation, however, the estimation results slightly improved: the explanatory power of the model strengthened as its adjusted $R^2$ increased from 0.364 to 0.400.

VI. CONCLUSION

The paper attempted to identify the country-specific features influencing FDI inflows into India and the reasons behind India's recent emergence as an attractive FDI destination in developing Asia. The empirical evidence, through vector error correction estimation, can be summarized in the following manner. First, all the explanatory variables-GNI, WAGE, CUSTD-are found to form a statistically significant and stable long-run equilibrium relationship with FDI inflows into India. Second, GNI and WAGE are revealed to be significant in both cases and the signs of the coefficients are positive and negative, respectively, consistent with expectation. Third, the coefficient of CUSTD is negative, indicating that an increase in the tariff rate reduces inward FDI. In other words, the results refute tariff jumping argument in India's case. From this finding, it can be implied that less protection measures stimulate more FDI in India. Finally, the dummy variable is revealed to not be significant at any reasonable level of significance, i.e., the influence of economic reform on its FDI inducement was not statistically significant.

The studies on how fundamental country level factors affect aggregate country level FDI behavior have been paid greater attention from more recent researches. The ever greater availability of both macro- and micro-level data should help create more insightful and innovative papers in the future.
Much more can be done from this paper. First, the equation is designed to test the classical assumptions of production-market size, wage, capital cost and tariff rate. Therefore, the structure and type of FDI can be considered in the future empirical studies on the FDI-growth links in India. Second, geographical distribution of FDI can be considered. The distribution may largely depend on the infrastructure or fiscal incentives given by each state government. Then state level research might be pursued to identify the state-specific factor and its impact on FDI inflows. Clustering, through SEZs for example, may be an important factor in foreign investors' decisions. Third, the quality of institutions, such as legal protection of assets or government fiscal incentive, is also likely to be an important determinant of FDI, particularly for less developed countries. But researchers should be very careful about employing the proper measures as estimating the magnitude of the effect of institutions on FDI is difficult because there are no accurate measurements of institutions.

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ENDNOTES

1 However, there are controversies on technology spillovers. During the recent period, we observed that many countries compete with each other to attract foreign investment. When multinational companies invest in a host country, it is assumed that a part of their technology spills to the host country firms. But the empirical studies on spillover effects of FDI have failed to find robust empirical results about the possibility of positive spillover effects.
2 Portfolio flows of foreign capital are often guided by short-term risk-return payoffs and are prone to quick reversals in the event of adverse expectations.
3 In July 1991, the Indian economy was perilously close to declaring bankruptcy as the reserves shrank rapidly towards nothing.
4 For example, the tax revenue collected by the Indian government from customs duties divided by import value decreased from the peak rate of 61.6 in 1987 to 9.63 in 2003 (RBI).
5 Ministry of Commerce and Industry (http://dipp.nic.in).
6 But some sectors still have equity limit for foreign invests: Insurance (26%), Domestic airlines (49%), Telecom services (74%), Private sector banks (74%), Mining of diamonds and precious stones (74%), Exploration and mining of coal and lignite for captive consumption (74%). There are exceptional cases on taxing as agreed on the Convention on Avoidance of Double Taxation with 71 countries.
7 Recently, a growing literature has recognized the theoretical possibility of two-way feedbacks between FDI and economic growth along with their long-run and short-run dynamics (Chakraborty and Nunnkenkamp 2006).
8 Firms wishing to invest in a particular country for serving third-country markets through exports aim to take advantage of some particular features of host countries. Such FDI is not only export-oriented, but is also concentrated in a part of the production chain and is therefore ‘vertical’ in nature.
9 The importance of clusters for attracting foreign direct investment seems significant especially in less developed countries where overall business environment is constrained by a variety of regulation. Under these circumstances, the combination of setting up a cluster and implementing policy reforms can be a key engine for attracting FDI.