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Impact of Fdi in India: State-Wise Analysis in an Econometric Framework

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Impact of Fdi in India: State-Wise Analysis in an Econometric Framework

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I. Introduction

The importance of Foreign Direct Investment (FDI) is not limited to the financial capital that flows. The globalization of activities by multinational enterprises (MNEs), jointly with the efforts made by all kinds of governments, has transformed the role of FDI not only as a development indicator but also its close linkages with trade, technology transfer and financial flows (UNCTC, 1991). Economic growth of the host country increases due to increase in FDI by channelising foreign investors' managerial, technical, financial, accounting or legal expertise into new infrastructure and other projects. Competition from foreign companies can lead to productivity gains and greater efficiency in the host economy. Further application of foreign investor's policies to a domestic subsidiary may improve corporate governance. The standard of living in the host country is also improved and it can offset the volatility created by foreign institutional investment. In developing countries especially, FDI can result in transfer of all types of scarcities- financial capital, technological know-how, efficient managerial techniques, organizational skills and access to market abroad. The host country may be able to benefit from the employment opportunities created by new investors. FDI is also seen as a source of producing tangible and intangible assets in the host economy. It may provide rents (including high wages, benefits and profits) and potential spillovers and externalities that are extremely favourable to the host country's economic growth (Moran, 1998). Foreign firms seek not only domestic markets, but also provide access to external markets by sourcing manufactured products from domestic market (Nagraj, 2003). In short, FDI inflows can be a tool for bringing knowledge, managerial skills and capability, product design, quality up- gradation, brand names, channels for international marketing of products, and consequent integration into global production chains, which are the basis of a successful exports strategy (BlomStrom, Lipsey and Zejan, 1994; Borensztein, De Gregorio and Lee, 1998; United Nations Conference on Trade and Development (UNCTAD) 1999; Organization for Economic Cooperation and Development (OECD) 2002, Kokko, 1994).

Turning to India, a severe macro-economic and balance of payment crisis in 1991 led to an extensive and complete break from insulation strategy and opened the economy to import competition and to foreign investment. Foreign investment was introduced in 1991 under Foreign Exchange Management Act (FEMA), by then finance minister Manmohan Singh. Thereafter FDI inflows in India have undergone a significant improvement as compared with FDI inflows into all developing economies (RBI, 2008). High economic growth has resulted in high growth in domestic market, which is prime engine for India's viability as an investment destination for foreign investment. In addition, the FDI policy rationalization measures taken by the government have resulted in increased FDI inflows over the years. According to UNCTAD World Investment Prospects Survey 2007-2009, India emerged as second most favoured FDI destination after china. With India and China becoming important players in the global economy; it is indeed a great value and learning experience to undertake the research on the impact and incidence of FDI.

FDI inflows within India are quite uneven and is heavily concentrated around the relatively fast moving reformers, with already advanced industrialization, such as Andhra Pradesh, Gujarat, Karnataka, Maharashtra, Delhi and Tamil Nadu whereas, Kerala, Orissa, Madhya

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Pradesh, Punjab, Rajasthan and West Bengal are lagging behind (see Appendix I and II). It is generally accepted that growth performance of the states has become more skewed after the reforms. Economic and political weekly (EPW) Research Foundation (2003) reports that the coefficient of variation (CV) in growth rates of gross state domestic product (GSDP) rose from 30.52 % during 1980-81 to 1990-94 to 41.1% during 1993-94 to 2000-01 and that of per capita GSDP from 50.20 to 68.04 during the same period. It also shows that Gini coefficient, a measure of inequality, has been rising over the years. Considering all the states together, it slowly moved up from 20.9 in 1980-81 to 22.8 in 1991-92 but has moved sharply after the reform and reached 29.2 in 2000-01. This paper thus tries to explore whether the impact of FDI inclined towards the skewed growth in India making rich states richer in relative terms and poor states lagging behind.

What follows in the following section is the review of relevant literature in section 2. Section 3 deals with model specification and econometric analysis. Section 4 discusses the result and section 5 concludes the paper.

II. Literature Review

The studies on impact of FDI are very limited. These studies have identified impact of FDI inflows on number of factors. However, many of these factors are either country-specific or industry-specific and would not apply to state/provincial level of FDI flows. It is evident from the empirical literature that there is either a positive or negative effect of FDI on economy and growth of the host country. A positive relationship between FDI and economy growth in china's economy was found by Chen et al (1995) and Berthelemy and Demurger (2000). A number of empirical studies have directly measured the spillover from foreign investment. For example, Caves (1974) examined the impact of foreign presence on value added per worker in Australian domestically owned manufacturing sectors and found that the disparity between foreign and domestic value added disappeared as the foreign share increased in labour-intensive sectors. Blomstrom and Persson (1983) also found that labour productivity was significantly higher in sectors where foreign firms employed a higher share of labour force. While Blomstrom and Edward (1989) found faster productivity growth and faster convergence of productivity levels in sectors with higher level of foreign ownership.

Ramstetter (1993) developed a macroeconomic model analyzing macroeconomic effects of FDI in Thailand. His model allowed simulations of effects of policy changes on enterprises for different ownerships. An examination of the impact of foreign investment on firms in Morocco's manufacturing sectors by Haddad and Harrison, 1993 suggested that foreign firms showed higher total factor productivity but their rate of productivity growth was lower than that of domestic firms.

On the other hand some of the negative spillover arising due to FDI was evident in the studies of Markusen and Venables, 1997, Agosin and Mayer, 2000 which stated that the most immediate and evident externality of MNE on domestic firms is that there will be some distortion in their market share. A rather neutral effect was observed by Fry (1992) who examined the macroeconomic effects of FDI on 16 developing countries. His findings suggested that: a) FDI inflow neither increased domestic investment nor did it provide additional balance of payment (BOP) financing; b) an increase in FDI reduced national savings; c) FDI did not exert significantly different effects on the rate of economic growth compared to domestic investment and d) FDI exerted both direct and indirect effects on current account. Bos et al (1974) also found that FDI played a minor role in increasing the income of the host country, while it posed a heavy burden on BOP. These effects were quite prominent in countries like, India, Philippines, Ghana, Guatemala, Argentina and Zaire.

The study in Indian context by Dua and Rashid (1998) shows a one-way causality from index of industrial product (IIP) to FDI where, IIP is taken as a proxy for GDP. However, IIP cannot be a proper proxy of GDP as industrial production contributes less than 30% of GDP. Chakravorty and Basu (2002) have tried to find out the impact of FDI on growth in India using vector error correction method. The model reveals that GDP in India was not caused by FDI and FDI in India tended to lower the unit of labour cost i.e. FDI was labour displacing. Raut (1995) in his study for Indian manufacturing sectors examined the R&D spillover using panel data over 1975-86. He observed the contribution of in-house R&D capital and industry-wise R&D capital to the productivity growth of private firms in India and points out that spillover R&D is a highly significant determinant of productivity growth. A statistically significant impact of imported disembodied technologies on productivity in Indian industries was observed by Rana & Hasan (2001).

There is hardly any study to show the impact of FDI at state level in India. The literature on influences of FDI within a country is relatively scarce. Most of the available studies relating to FDI flows impacting the state/province level relate to developed countries. Thus the present study is an endevaour to explore the impact of FDI inflows at the state level. The present study is expected to become the first of its kind where both overall impact and across the state impact of FDI are analysed simultaneously in India. The present study have made use of three models Fixed effect (FE), Random effect (RE) and Seemingly Unrelated Regression (SUR) model to examine the impact of FDI at the state level. This is a new attempt in this area as

rarely FE, RE and SUR models are used in the studies related to the impact of FDI. This paper contributes to the growing strand of literature by highlighting the role of advanced technology in introduction of productivity growth and employment growth and the requirement of absorptive power in these processes.

III. Model Specification and Econometric Analysis

While there are many empirical studies on the impact of FDI in developing countries, few of them have been carried out in India in an econometric framework especially in the transient period of post-reform. This paper which gives a holistic as well as detailed view of the spillover of FDI in different states in India has not been applied so far. We tested the effect of FDI on productivity and employment across different states in India and also investigated whether this impact of FDI in the post reform period depends on the absorptive capacity of the recipient states and indicate policy implication there from.

We assume that the impact of FDI on the above dependent variables is different in each state during this transient period. This is a more detailed study than assuming a common effect of FDI on these variables in India as a whole. Three models appropriate for the study have been made use of. They are Fixed Effect (FE), Random Effect (RE) and Seemingly Unrelated Regression (SUR). Panel estimator is a standard where elasticity coefficients are assumed to be constant, and the intercept varies over individual capturing the effects of those omitted variables that are specific to individual cross-sectional units but stay constant over time. However, any inference on the impact of FDI based on panel data model can be erroneous because of possible simultaneity between dependent and independent variables. Since the direction of causality remains uncertain (whether FDI is impacting higher labour productivity/employment or labour productivity/ employment is causing higher FDI inflows) in the analysis, we tackled this problem using SUR model. In principle, the endogeneity problem can be tackled by applying instrumental variable techniques but the fundamental problem is that there are no ideal instruments available. A good instrument would be a variable which is highly correlated with FDI but not with the error term in these regressions. The results of this instrumental variable estimation are reported in a similar analysis by Borensztein et al (1998) wherein it is considered that the instrumental variable estimation yields qualitatively similar result to those obtained by SUR estimation. Moreover in SUR model, the response parameter are allowed to vary from one unit to another invariant over time (and the errors are allowed to be contemporaneously correlated and heteroscedastic between individuals) since it is quite possible that different attributes over the states will be reflected in different elasticity coefficients (Judge, et al. 1985). Hence the present study uses SUR model proposed by Zellner (1962) to estimate the effects of FDI on labour productivity and domestic employment across eight states of India over a period of fourteen years from 1991-2004. The eight states of India are chosen from all the four regions viz. Delhi and Haryana from North, West Bengal and Orissa from East, Maharashtra and Rajasthan from West, and Karnataka and Kerala from South.

a) Hypotheses

Based on the analytical framework and literature we derive some hypotheses regarding the impact of FDI, on labour productivity and employment growth across the regions in India.

H_{11}: FDI would have a positive impact on labour productivity across all the states of India.

H_{12}: Impact of FDI on labour productivity would be different in each state.

H_{21}: FDI would have a positive impact on domestic employment across all the states of India.

H_{22}: Impact of FDI on domestic employment would be different in each state.

b) Data, Variables and Methodology

Approved FDI data over the post reform period 1991-2004 for the eight selected states have been collected from the Secretariat of Industrial Assistance (SIA) newsletter, a publications of the Ministry of Industries and Commerce, Government of India. The data for the other variables are compiled from Handbook of statistics on the Indian economy (Reserve Bank of India), Indian statistical abstract, various issues, labour bureau, Ministry of Labour, Annual Survey of Industries, India all at state level. Several missing values for some observations were extrapolated.

The rationale behind the selection of these variables and their possible relations with FDI are discussed below before the empirical model is specified and tested.

c) Labour Productivity

The literature is optimistic about the impact of multinationals on host-country's productivity. The studies which find a positive correlation between average industry productivity and the presence of foreign firms in the industry include Globerman (1979) for Canada in 1972, Blomstrom and Persson (1983), Blomstrom (1986), and Kokko (1994) for Mexico in the 1970s, and Blomstrom and Sjoholm (1999) for Indonesia in 1991. The literature further provides the evidence the benefits that the host economies acquire are quite uneven, both across and within countries.

In the present study, net value added per worker has been taken as dependent variable to

measure labour productivity. Relative labour productivity has been used as a proxy for absorptive capacity. On the other side, along with FDI, other independent variables include gross capital formation and wage rate. Gross capital formation is taken as a proxy for the growth of domestic investment. It is hypothesised that The SUR model postulated for the impact study would be:

$$lnLP_{it} = \gamma_s + \lambda_{1s} \ln FDI_{st} + \lambda_{2s} \ln GCF_{st} + \lambda_{3s} \ln W_{st} + u_{st} \quad (1)$$

$$s = 1, 2.....8$$
$$t = 1, 2 ...10$$

Where LP is labour productivity; GCF and W are gross capital formation and wage rate respectively.

All the variables, dependent and independent, are deflated with their appropriate price indices and then they are transformed into log scale. FDI taken as percentage of SDP and deflated by wholesale price index is one of the independent variables Coefficients in the log-linear model directly measure elasticities of FDI with respect to explanatory variables.

To find whether the response parameters vary significantly from one state to another, which is invariant over time, some tests have been carried out using the three models: (a) pooled model with common intercept and slope, (b) panel data model with constant slope and heterogeneous intercept, and (c) SUR model with heterogeneous intercept and slope.

The null hypotheses postulated for the study are as follows:

H_{11} : Both elasticity and intercept coefficients are the same for all states.

That is: $\gamma_1 = \gamma_2 = ... = \gamma_S$

$\lambda_1 = \lambda_2 = ... = \lambda_S$

H_{12} : Regression elasticity coefficients are identical, while intercepts are not.

That is: $\lambda_1 = \lambda_2 = ... = \lambda_S$

H_{13}: Regression intercepts are the same, while elasticity coefficients are not.

That is: $\gamma_1 = \gamma_2 = ... = \gamma_S$

Under the assumption that u_{st} are independently and normally distributed over s and t with mean zero and variance $\sigma^2 u$, F-tests are used to test the null hypotheses H_{11}, H_{12}, and H_{13}.

Under H_{11}, the F-statistic carried out would be:

$$F_1 = \frac{(S_3 - S_1) / [(N-1)(k+1)]}{S_1 / [NT - N(k+1)]}$$

Where, S_3 is the residual sum of squares of common intercept and slope;

S_1 is residual sum of squares of within group with heterogeneous intercept and slope.

both gross capital formation and wage rate exert direct influence on labour productivity.

The first hypothesis relates to the production effect proxied by net value added per worker, wherein it is said that FDI may increase the labour productivity in states.

If F1 is not significant, we pool the data and estimate a single equation. If the F ratio is significant, a further attempt is made to find out if the non-homogeneity is due to heterogeneous slopes or intercept.

Under the null hypothesis of heterogeneous intercept and homogeneous slope (H12), the F-statistic would be

$$F_2 = \frac{(S_2 - S_1) / [(N-1)k]}{S_1 / [NT - N(k+1)]}$$

Where, S_2 is residual sum of squares of constant slope with heterogeneous intercept.

If F_2 with (N-1) K and NT - N (K+1) degrees of freedom is significant, then the null hypothesis of heterogeneous intercept but homogeneous slope is rejected. However, if F_2 is not significant, we can then determine the extent to which non-homogeneity can arise in the intercepts (Hsiao, 2003). If H_2 is accepted, we can apply a conditional test for homogeneous intercepts, as

H_3: $\alpha_1 = \alpha_2 = ... = \alpha_N$, given $\beta_1 = \beta_2 = ... = \beta_N$

The F_1-test carried out on the residual sums of squares for SUR and pooled data model rejects the hypothesis for homogeneous intercepts and elasticity coefficients. Further, to find out whether non-homogeneity is due to heterogeneous slopes or intercepts, F_2-test has been carried out on the residual sums of squares for FE and SUR data and has been found to be significant at 1 percent level. This rejects the second hypothesis that regression elasticity coefficients are homogeneous and intercepts are not. These two F-tests suggest that the model $y_{it} = a_i + \beta_{ki} x_{it} + u_{it}$ is treated as maintained hypothesis (Hsiao, 2003).

d) Impact on Employment

The recent rise in unemployment in a number of countries in the context of the growing globalization has focused the attention on issues related to FDI and its potential employment effects in the host countries. Conversely MNEs can play an important role in generating employment directly as well as indirectly through backward and forward linkages. In general inflows of FDI are not necessarily associated with a net

generation or displacement of employment to such an extent as to have an insignificant influence on the aggregate level of employment. Employment creation is one of the many aspects which are related to inward FDI.

Empirical studies supported by the recent evidence suggest that MNEs can help in development process in the host countries by facilitating employment of local labour, transferring technology to the host countries as well as expanding trade and integration into The SUR model is given as follows:

$$lnE_{it} = \gamma_s + \lambda_{1s} \ln FDI_{st} + \lambda_{2s} \ln PI_{st} + \lambda_{3s} \ln GCF_{st} + u_{st} \quad (2)$$

$$s = 1, 2.....8$$
$$t = 1, 2 ...10$$

Where, E is employment; PI and GCF are per capita income and gross capital formation respectively.

To find whether the response parameters vary significantly from one state to another, which is invariant over time, we performed the same tests as above using the three models: (a) pooled with common intercept and slope, (b) panel data model with constant slope and heterogeneous intercept, and (c) SUR model with heterogeneous intercept and slope. The F_1-test carried out on the residual sums of squares for SUR and pooled data model rejects the hypothesis for homogeneous intercepts and elasticity coefficients. Further, F_2-test carried out on the residual sums of squares for FE and SUR data has been found to be significant at 1 percent level. This rejects the second hypothesis that regression elasticity coefficients are homogeneous and intercepts are not. These two F-tests suggest that the model $y_{it} = a_i + \beta_{ki}x_{it} + u_{it}$ is treated as maintained hypothesis.

IV. Discussion of Results

a) *Impact on Labour Productivity*

i. *Overall Impact*

The Pooled, FE and RE result of impact of FDI on labour productivity concludes that overall benefit to the states is encouraging (see table 1). Hausman test statistics shows RE model to be superior to FE model. RE model captures the state-specific time-invariant effects on its intercept. The elasticity estimate of labour productivity due to FDI is positive and significant at one per cent. This result reveals that the states have benefited in general as labour productivity increases due to spillover effect of foreign direct investment through the introduction of capital, technology and managerial skill.

ii. *State-Specific Impact*

It should be emphasized here that the panel data methodologies focused on the different responses controlling the individual-specific time-invariant effects. global markets. However, the view of most economists seems to be that no firm conclusion is acceptable about the net employment effects of FDI.

The second hypothesis states that FDI may have a favourable impact on employment growth. Gross capital formation is taken as a proxy for the growth of domestic investment and it is hypothesised that both gross capital formation and per capita income would also exert direct influence on employment along with FDI.

Allowing for the possibility of the slope coefficients to vary across states as well and the error term to contemporaneously correlate across industries, Table 2 summarizes the results based on SUR model. The result from the SUR model reveals a significant positive impact of FDI on labour productivity in West Bengal, Karnataka, Kerala and Maharashtra, while the elasticity estimate of labour productivity with respect to FDI is positive and insignificant in Delhi and Haryana. However the elasticity estimate of labour productivity with respect to FDI is negative and significant in Orissa and Rajasthan which are relatively less developed states. The effect of FDI on labour productivity is found to be significant and positive in the group of catching-up and/or more developed states. If the technology gap between the foreign and domestic set up is low it may lead to assimilate and exploit knowledge from the environment. On the other hand the impact of FDI on the receiving states, for instance Orissa and Rajasthan, will fail to materialise if there is lack of sufficient abilities to adopt superior technologies used by foreign firms. This shows that the level of growth is positively associated with the beneficial impact of FDI. Borensztein et al. (1998) and Balasubramanyan et al. (1999) also confirm the relation between the impact of FDI and the quality of human capital. The potential for positive spillovers depend on absorptive capacity and the presence of innovation capabilities in the host regions. The impact of FDI on productivity critically depends on the capacity to absorb technology in the host country (Nelson and Phelps, 1966; Benhabib & Speigel, 1994). FDI is an important vehicle for the transfer of technology also suggested that the application of this advanced technology requires the presence of human capital in the host country.

The more the economy is better developed, the more the state is ready to benefit from FDI. The policy implication of this result is that the favourable impact of FDI on productivity can be strengthened by improving the absorptive capacity of the recipient states.

b) Impact on Employment

i. *Overall-Impact*

Following the similar methodology as in the preceding section, the Hausman test shows RE model to be superior to FE models. The elasticity coefficient of employment with respect to FDI in RE model is positive and significant (table 3). The result is thus encouraging showing an overall expansion in employment in the states.

ii. *State-Specific Impact*

F-tests carried out between pooled, FE and SUR model reject the null hypotheses that regression elasticity coefficients are identical, and intercepts are not. After controlling for the size, FDI has uneven impact on employment in the states. There is a clear trade-off between labour productivity and employment. There is a significant negative impact of FDI on employment in the cases of West Bengal, Delhi, Kerala and Maharashtra. The more developed states, where the labour productivity has increased due to FDI inflows there is a reduction in the number of employed. On the other hand, FDI has a positive and significant impact on employment in Rajasthan, Orissa, Haryana and Karnataka (table 4). Thus less developed states show employment expansion with hardly any productivity improvement. This is probably due to labour intensive nature of the industries in these states where labour cost is already low.

Developed states on the other hand both labour cost is high and technology intensive industries are dominant labour productivity has taken place in a more pronounced manner. While SDP growth rate has not been at the same pace as the rate of improvement in labour productivity, employment contraction has taken place. Since our data is from 1991-2004, this clearly is the transient state where growth rate lags labour productivity improvement. The same is not true in the case for underdeveloped states such as Rajasthan and Orissa, as there has been hardly any labour productivity improvement with economic growth which is showing in expansion of employment in such states. However, in states such as Haryana and Karnataka there are few exceptions to these two trends where expansion of economy has inched passed the labour productivity improvement, it clearly shows that these states have already taken off in economic growth.

V. Summary and Conclusions

We tried to analyse the spillover effects of FDI on eight different states in India in the post reform period between 1991 and 2004. We used FE and RE models to study the overall effect of FDI and SUR model for more holistic picture. The FE and the RE model result revealed that the overall impact of FDI on productivity and employment is quite encouraging for the period considered. However the SUR model which gave a detailed picture of the impact of FDI showed that across regions the impacts are quite uneven. For example FDI has a significant positive impact on labour productivity in West Bengal, Karnataka, Kerala and Maharashtra, whereas, in Orissa and Rajasthan labour productivity was negative and significant. The effect of FDI on employment was significant and negative in West Bengal, Delhi, Kerala, and Maharashtra; while other states exhibited a significant positive impact. Thus, those states where the labour productivity is rising due to FDI inflows generally revealed a significantly negative impact on employment except for Karnataka and Haryana, where the impact of FDI on both labour productivity and employment are positive and significant.

The above findings show that the impact of FDI on labour productivity is negative in less developed states, while it has significant and positive effect in catching-up and/or more developed states where technology intensive sectors are predominantly prevailing. For underdeveloped states there has hardly been any labour productivity improvement which showed in expansion of employment. Thus it can be concluded that the impact of FDI on productivity significantly depends on the absorptive capacity of the recipient states which may enhance the spillover effect and thereby strengthen the impact of FDI on productivity growth. That is, it is likely that at very low levels of absorptive capacity the potentially positive impact of FDI may fail to materialize. In Karnataka and Haryana where SDP growth has surpassed the labour productivity improvement there are exceptions to these two trends. It showed that these states have already taken off.

This poses a big question as to whether liberalisation is making the rich states richer in relative terms and leaving the poor states lagging behind or will it lead to any convergence across states. However, creating favourable conditions for FDI is likely to support productivity convergence. The favourable impact of FDI on productivity can be strengthened by improving the absorptive capacity of the recipient states.

Table 1 : Panel Data Model (Overall Impact On Labour Productivity)

Variable	Pooled	Fixed effects	Random effects
ln(fdi)	0.043(2.981)***	0.013(1.734)*	0.014(1.777)*
ln(gcf)	0.000(0.073)	0.004(0.827)	0.004(0.783)
ln(wage)	1.037(5.909)***	1.347(9.483)***	1.326(9.089)***
Constant	6.444(21.561)***	_	6.856(26.789)***
R^2	0.43	0.60	0.58
Adj. R^2	0.41	0.59	0.57
Nobs, Nvar	112,4	112,4	112,4

Note: Against each variable, the first row represents the elasticity coefficient and t-statistics in the parentheses.
** significant at 10 percent, ** significant at 5 percent, *** significant at 1 percent*
Hausman Test: Ho: Random Effects; Ha: Fixed Effects
Statistic = -0.486; Probability = 0.999

Table 2 : Sur Model (State-Wise Impact On Labour Productivity)

Variable	Rajasthan	W.B.	Delhi	Haryana	Karnataka	Kerala	Maharashtra	Orissa
ln(fdi)	-0.042 (-5.081)***	0.041 (7.194)***	0.007 (0.575)	0.001 (0.224)	0.025 (4.749)***	0.039 (8.633)***	0.051 (17.225)***	-0.008 (-2.742)**
ln(gcf)	-0.018 (-5.235)***	0.181 (3.281)***	-0.016 (-0.303)	0.008 (3.940)***	0.062 (0.860)	0.125 (2.980)**	-0.041 (-1.824)	0.051 (1.480)
ln(wage)	3.466 (18.515)***	2.257 (9.907)***	1.873 (7.432)***	2.261 (10.813)***	0.486 (3.429)***	0.833 (7.589)***	1.702 (9.788)***	0.882 (8.538)***
Constant	10.473 (34.203)***	6.523 (21.510)***	8.212 (20.044)***	8.386 (25.373)***	5.248 (7.757)***	5.135 (21.020)***	7.690 (22.667)***	5.835 (17.866)***
R^2	0.61	0.85	0.67	0.84	0.88	0.88	0.89	0.67
Adj. R^2	0.41	0.77	0.50	0.77	0.79	0.83	0.85	0.48

Note: Against each variable, the first row represents the elasticity coefficient and the second row gives the t-statistics in parenthe¬ses.
significant at 10 percent, ** significant at 5 percent, * significant at 1 percent*

Table 3 : Panel Data Model (Overall Impact On Employment)

Variable	Pooled	Fixed effects	Random effects
ln(fdi)	-0.0134(-1.141)	0.010(2.427)***	0.009(1.821)*
ln(pci)	0.564(14.366)***	0.077(2.291)**	0.127(3.329)***
ln(gcf)	-0.011(-1.269)	0.003(0.967)	0.002(0.527)
Constant	3.353(13.029)***	-	6.104(23.964)***
R^2	0.75	0.18	0.21
Adj. R^2	0.74	0.16	0.18
Nobs, Nvar	112,4	112,4	112,4

Note: Against each variable, the first row represents the elasticity coefficient and t-statistics in the parentheses
significant at 10 percent, ** significant at 5 percent, * significant at 1 percent*
Hausman Test: Ho: Random Effects; Ha: Fixed Effects
Statistic = -7.826; Probability = 0.999

Table 4 : Sur Model (State-Wise Impact on Employment)

Variable	Rajasthan	W.B.	Delhi	Haryana	Karnataka	Kerala	Maharashtra	Orissa
ln(fdi)	0.022 (20.636)***	-0.005 (-2.655)**	-0.040 (-5.770)***	0.006 (11.302)***	0.027 (12.344)***	-0.027 (-14.45)***	-0.004 (-4.155)***	0.003 (4.610)***
ln(pci)	0.030 (6.442)***	-0.057 (-3.066)**	-0.179 (5.592)***	0.127 (30.577)***	0.462 (7.728)***	0.814 (12.986)***	0.145 (19.201)***	-0.004 (-0.271)
ln(gcf)	0.006 (20.609)***	-0.025 (-1.325)	0.461 (18.945)***	0.000 (0.712)	-0.124 (-3.412)*	-0.129 (-11.98)***	0.051 (6.476)***	0.073 (5.537)***
Constant	6.154 (230.244)***	7.467 (35.236)***	5.998 (25.126)***	6.528 (208.21)***	4.701 (10.755)***	2.659 (6.972)***	5.933 (106.831)***	5.784 (32.455)***
R^2	0.74	0.27	0.81	0.83	0.58	0.82	0.80	0.15
Adj. R^2	0.62	0.09	0.71	0.75	0.38	0.74	0.75	-0.27

Note: (1) Against each variable, the first row represents the elasticity coefficient and the second row gives the t-statistics in parentheses.
** significant at 10 percent, ** significant at 5 percent, *** significant at 1 percent*

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Appendix I

State-wise Number of Approvals and Amount Approved of Foreign Direct Investment (FDI) and Foreign Technical Collaboration (FTC) in India (August 1991-December 2004)

States/UTs	No. of Approvals	Amt. of FDI Approved		Percentage to total
	Total	(Rs. Million)	(US$ Million)	% to total
Andhra Pradesh	1296	116344.4	3055.12	4.65
Assam	19	14.95	0.48	-
Bihar	49	7397.05	180.18	0.3
Gujarat	1242	124625.1	3278.24	4.98
Haryana	882	38763.08	1020.38	1.55
Himachal Pradesh	102	12266.45	309.43	0.49
Jammu and Kashmir	5	84.1	2.42	-
Karnataka	2649	190963.9	4837.22	7.63
Kerala	336	17815.42	446.69	0.71
Madhya Pradesh	243	92714.08	2520.93	3.7
Maharashtra	5064	371077.9	9640.37	14.82
Manipur	2	31.85	0.89	-
Meghalaya	5	529.6	13.66	0.02
Nagaland	2	36.8	1.03	-
Orissa	141	82293.13	2355.78	3.29
Punjab	203	21303.54	534.98	0.85
Rajasthan	344	29112.11	782.29	1.16
Tamil Nadu	2686	226512.9	5895.99	9.05
Tripura	4	30.88	0.74	-
Uttar Pradesh	815	48365.63	1307.93	1.93
West Bengal	689	77971.3	2167.03	3.11
Chattisgarh	48	6363.03	183.33	0.25
Jharkhand	81	1465.15	42.67	0.06
Uttaranchal	52	1256.49	38.66	0.05
Andaman & Nicobar	8	137.87	3.56	0.01
Arunachal Pradesh	2	110.6	3.52	-

Chandigarh	86	3241.7	80.34	0.13
Dadra & Nagar Haveli	72	1239.8	35.93	0.05
Delhi	2816	305226.3	8445.36	12.19
Goa	285	9993.78	251.93	0.4
Lakshadweep	1	5	0.19	-
Mizoram	1	15.22	0.35	-
Pondicherry	130	12861.53	313.74	0.51
Daman & Diu	44	590.34	14.72	0.02
States Not Indicated	6062	703435	19522.95	28.09
Grand Total	26466	2504196	67289.02	100

Note: The information excludes FDI raised through GDRs/ADRs.
Source: Compiled from the statistics released by Ministry of Commerce and Industry, Govt. of India

Appendix II

State-Wise Growth Rate of Net State Domestic Product (NSDP) at Current Prices in India (1994-95 to 2004-05)

States\UTs	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04
Andhra Pradesh	19.6	16.2	13.5	5.2	21.1	8.7	11.8	7.9	8	13.4
Arunachal Pradesh	7.5	22.7	1.1	10.1	13.6	7.6	9.5	8.4	9.7	13.9
Assam	15.9	10	7.5	9.5	12.4	15.7	7.6	8.5	9.3	6.5
Bihar	13.7	7.6	34.9	2.9	14.9	9.6	10.7	-0.2	13.8	-2.6
Jharkhand	11.2	8.6	6.6	34.8	13.9	-1.5	-10.5	16.7	13	9.5
Goa	18.2	16.5	20.6	25.4	25.1	11.8	13.8	4.4	15.8	5
Gujarat	31.6	10.2	20.2	4.2	16.2	2.8	-2.6	12.4	16.2	20
Haryana	19.1	13.1	19.8	8.2	13.1	11.9	12.8	10	9.5	12
Himachal Pradesh	22.2	14.2	14.7	14.8	21.8	14.5	11.3	10.2	8	11.3
Jammu & Kashmir	9.1	16.2	12.6	12.8	25.6	9.5	5.1	8	11	8.2
Karnataka	16.4	16.2	16.1	11.5	21.6	7.5	10.3	3	9.6	9.9
Kerala	21.7	21.7	15.2	10.3	13.7	11.6	11.9	1.8	13.6	8.7
Madhya Pradesh	10.3	12.5	15.4	9.4	15.5	12.5	-6.5	15.6	-3.8	21.8
Chhatisgarh	8.5	9.4	13.4	12.1	10.7	5	-3.7	22.4	4.2	23.6
Maharashtra	14.5	20.8	12.8	8.7	8	16.3	-3	11.8	13.3	9
Manipur	7	15.5	17.3	13.8	12.9	16	2.1	17.1	3.6	8.8
Meghalaya	9.4	20.7	9.8	14.1	19.1	12.8	14.8	10.8	7.5	9.4
Mizoram	8.7	27.8	14.4	4	11.4	13.1	26.9	8.7	14.1	NA
Nagaland	16.5	13.7	11.7	15.6	2.2	6.7	47.1	12.8	15.4	NA
Orissa	20.2	22.4	-4.8	23.5	11.5	9.9	-1.5	8.1	4.3	26
Punjab	12.8	12.1	14.3	10.2	15.1	9.4	8.5	7.1	3.9	10.4
Rajasthan	26.8	13.5	22.3	11.6	15.3	5.9	0.6	11.7	-5.4	27.1
Sikkim	8.5	18.2	13.7	15.3	16.2	6.8	15.7	10.9	14.1	11.8
Tamil Nadu	18.7	13.8	13.5	17.2	14.1	6.5	11.9	0.7	8.1	8.5
Tripura	4.3	22.8	20.6	20.6	15.2	20.7	16.1	14.2	8.7	11.3
Uttar Pradesh	16.5	12.3	20.8	7.1	10.7	8.4	4.5	4.1	9.1	9
Uttaranchal	22.1	7.9	8.7	8.7	10.9	7.4	14.4	6.6	12.9	15.6
West Bengal	16.3	19.3	10.9	20.4	18.5	10.1	10.3	9.6	7.3	12.6
Andaman & Nicobar Islands	20.7	8.8	17.1	12.9	-7	12.2	2.2	8	11.1	NA
Chandigarh	19.2	20.9	20.3	14.9	17.2	14	8.3	11.3	16.8	15.4
Delhi	23.4	8.6	19.6	23	15.9	12	18.9	7.9	6	11.9
Pondicherry	14.6	13.1	55.6	40.6	14	4.1	22	9.8	22.1	14.3
India	17.3	16.6	15.9	11.8	15.5	12.3	7.6	8.6	7.7	13.2

Note: Position as on 21.07.2006
Source: Compiled from the statistics released by Ministry of Agriculture, Govt. of India.