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Labor Conflict and Foreign Investments: An Analysis of FDI in India*

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Abstract

This paper analyzes patterns of foreign direct investment in India. We investigate how labor conflict, credit constraints, and indicators of a state's economic health influence location decisions of foreign firms. We account for the possible endogeneity of labor conflict variables in modeling the location decisions of foreign firms. This is accomplished by using a state-specific fixed effects framework that captures the presence of unobservables, which may influence investment decisions and labor unrest simultaneously. Results indicate that labor unrest is endogenous across the states of India, and has a strong negative impact on foreign investment.

J.E.L. Classification Numbers: L2, L5, O2

Abbreviations: FDI, GSDP, EXIM, ICICI, OLS, LSDV

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Section 1: Introduction

With the initiation of liberalization policies and economic reforms in India in 1991, the role of private investment in economic growth and poverty reduction has gained significant importance.[1] States now have to compete with one another to attract new investment, especially from foreign sources. States benefit from the presence of foreign investment, both in terms of increased productivity and other spillover effects, as is evident from table 2 (these basic regressions are used to motivate our study). Table 2 shows that an increase in the absolute number of foreign projects and an increase in the share of foreign projects (in total new investment) have clear positive effects on net value-added and the net income of states.[2] This paper studies the location patterns of foreign projects in India, and examines how sensitive such patterns are to measures of labor conflict, credit availability, input costs, and other market factors. We find that such investment is particularly sensitive to variables that measure labor conflict at the state level.

To the best of our knowledge, our study is one of the first to evaluate the response of foreign direct investment (FDI) to measures of labor disputes and other state-level economic indicators in India. However, although labor unrest, credit availability, and other measures of the "economic health" of states exert a substantial influence on the location decisions of foreign investment, it is unlikely that such influences are exogenous. States wanting to boost growth have to put in place policies that will attract foreign investment. In particular, labor laws fall under the purview of state governments in India. While this introduces variation in labor statutes across the different states, it is also a possible cause for the endogeneity of state-level labor dispute measures.

In this paper, we implement an approach that allows us to control for the possible non-random nature of labor unrest. Our method is unique in that it not only allows us to confirm the

presence of endogeneity; it also allows us to sign the direction of the bias that results when the heterogeneous nature of labor unrest is not taken into account. We find striking evidence that new foreign investment in India is negatively influenced by state-level labor unrest, and positively affected by state-level credit and market features. Real gross domestic product exerts a positive influence on shares of FDI, whereas planned outlay and state-support for research and development have the hypothesized effects (although some of these are measured imprecisely). Furthermore, results from our state-fixed effects technique confirm that measures of labor conflict are endogenous in an analysis of FDI location in India.

Section 2: Literature Review and Facts about FDI in India

Governments do much to attract FDI since domestic firms operating in local markets benefit from the productivity and knowledge spillovers generated by foreign owned firms and their subsidiaries. Recent research has documented that productivity differences across countries are tied to variations in foreign and domestic innovation (Eaton and Kortum, 1999; Keller, 2002), and that flows of foreign direct investment significantly predict international technology transfers. The extent to which FDI is valued may be gauged by considering the incentives offered by governments to attract the flow of foreign funds. For example, the U.S. state of Alabama spent $230 million to influence the location of a Mercedes plant in 1994 (Head, 1998, p. 256).

Incentives to attract FDI are not provided by the governments of developed countries alone. Developing countries, particularly in East Asia, have managed to spur economic growth by harnessing the power of foreign direct investment. Researchers argue that the adoption of FDI-friendly policies was responsible for China's ability to maintain a growth rate that exceeded 10 percent per annum in the 1990s (Bajpai and Sachs, 2000, p. 4), and that by tapping into

foreign capital, technology, and markets, Malaysia was able to transform itself from an exporter of raw-materials to an exporter of manufactured commodities.

Since tangible evidence exists to suggest that increased flow of funds from overseas influences economic growth in the receiving economy, FDI has been linked to poverty reduction also. This is because growth lays the foundation for reducing poverty by increasing the "size-of-the-pie". Moreover, foreign enterprises may have indirect effects on poverty by incrementing human capital. When foreign firms hire local workers, the latter benefit from the training and other human resource improvements that may be offered by the foreign firm. That FDI is an important ingredient in poverty reduction initiatives cannot be disputed.

Despite these well-documented truths about FDI, India has lagged in terms of attracting its share of foreign capital. In discussing manufacturing firms in developing countries, Tybout (2000) summarizes that "…because of institutional entry barriers, labor market regulations, poorly functioning financial markets and limited domestic demand, the industrial sectors of developing countries are often described as insulated, inefficient oligopolies" (Tybout, 2000, p. 30). This was particularly true of India before 1991. After 1991, India adopted a policy of economic openness that liberalized banking, substantially reduced entry barriers primarily through a reduction in tariffs and the increased ability of foreign firms to repatriate profits overseas, and removed bureaucratic red-tape associated with foreign equity ownership in domestic firms of up to 51% (before 1991, foreign firms were allowed to own a maximum of 40% equity in Indian firms (Chibber and Majumdar, 1999, p. 213), after 1991, they were allowed controlling ownership). Such measures significantly improved flows of foreign capital into the country, although levels are still far from optimal. For example, the ratio of actual FDI as a proportion of FDI approved from 1991 to 1998 was only 21.7% (Bajpai and Sachs, 2000, p. 2) in

India, as opposed to China, Malaysia, Indonesia and Thailand, where this ratio was substantially higher.

Researchers have documented several obstacles to increased flows of FDI into India. These include the fact that foreign ownership of more than 51% equity still requires government approval, tariff rates continue to remain high by international standards, there is a lack of decentralized decision-making at the level of state governments, exit barriers still exist (for example, a firm that hires over one hundred workers needs to get approval from the state government before it can shut down operations), banking and insurance systems are not competitive, and finally, an overly militant work-force.

In this paper, we focus on the role of labor conflict for three reasons. First, depending on the (political) nature of the government in power, states pass amendments to labor laws that are either pro-worker or pro-employer. Thus measures of labor disputes may not be exogenous, and amendments may be passed to influence FDI flows. Second, the implementation of laws may be affected by other considerations. For example, in West Bengal, the Communist party has been in power for the past twenty years. It is well known that the party has a pro-worker bias. This may affect outcomes of collective bargaining even without any formal changes in labor policies. Such considerations may also affect FDI.

Our third reason for considering the influence of labor disputes in addition to other indicators of state-level economic activity stems from a paper (Sanyal and Menon, 2005), where it is shown that such factors significantly influence the location of new private and public projects in India from 1998-1999. If Indian projects are influenced by labor disputes, then it is possible that foreign projects, given their lack of knowledge of ground realities, are even more sensitive to these issues. We hypothesize that given costs of locating in India (exit barriers, lack

of adequate infrastructure, and other factors mentioned above), foreign firms will veer away from states that have a pro-worker bias (pro-worker bias may be signaled by a large number of labor conflicts) since such biases may translate into higher production costs, and lower profits.[3]

Section 3: Econometric Methodology

Summary:

We begin by providing a summary of our econometric methodology. Our estimation technique is implemented in two steps. The aim in step one is to study the effect of labor disputes on shares of FDI that states receive. This aim underlies equations (1) and (2) of the paper. As seen below, equation (2) controls for the effects of labor disputes, credit variables from the Investment Credit and Industrial Corporation of India (ICICI) and the Export Import (EXIM) Banks, state growth rate, state support for R&D, and input costs variables such as wages and power rates. There could be other variables that affect FDI in addition to those controlled for in equation (2). Since we have no data on them, their absence would lead to spurious correlations between the labor disputes variable and error term in (2). Thus, a technique such as ordinary least squares (OLS) which treats labor disputes exogenously may indicate that disputes influence FDI purely because of spurious correlations that arise due to omitted variables. In the first step, we use a state-fixed effects method to study the influence of labor conflict on FDI shares. The fixed effects technique corrects for spurious correlations that arise from the presence of time-invariant state-level unobservables (omitted variables). Such unobservables cause our labor disputes measure to be endogenous. The state-fixed effects method corrects for the endogeneity of disputes and shows that they have significant negative effects on FDI, net of the credit, input costs, and other market variables listed above. Indeed, disputes have negative effects on FDI

shares net of everything that is state-specific and time-invariant, and absent from our model due to data constraints.

The aim in step two is to investigate what may be causing the endogeneity of the labor disputes variable. This aim underlies the formulation of equation (3) below. We hypothesize that literacy rates, proportion of urban male workers, measures of income inequality, and regional differences in India, influence state level indicators of labor disputes. Net of these variables, if the estimated state-level heterogeneity measures from equation (2) also significantly affect our labor disputes measure in (3), then we have evidence that our dispute measure is endogenous. We extract measures of state-level fixed effects from step one (coefficients for state-fixed effects are obtained once equation (2) is estimated) and use them to estimate equation (3) in step two. Results from the second step show that state-fixed effects have significant power in explaining our labor conflict variable, that is, they are significant in equation (3). This confirms that measures of labor conflict in India may not be treated exogenously. Sections 3.1 and 3.2 explain our two-step econometric methodology in greater detail.

Section 3.1: The State-Fixed Effects Model

We justify our use of a state-fixed effects model by first presenting a linear OLS regression:

$$f_{jt} = \gamma_{i'} L_{i'jt} + \beta_i X_{ijt} + \upsilon_{jt} \qquad (1)$$

where f_{jt} denotes the share of foreign projects in location (state) j at time t, X_{ijt} is a matrix of exogenous variables where i denotes a particular variable, j denotes a location, and t denotes time, $L_{i'jt}$ is a matrix of labor dispute variables where i' denotes a particular labor conflict variable for j, t defined above, and υ_{jt} is an idiosyncratic error term. Equation (1) relates the

share of FDI projects in state *j* at time *t* to labor conflict and other variables in X_{ijt}, under the assumption that the right hand side variables in (1) are exogenous.

Next, we implement a Durbin-Wu-Hausman test to check that $L_{i'jt}$ is indeed exogenous in (1). In order to accomplish this, $L_{i'jt}$ is hypothesized to be a function of regional dummy variables and the X_{ijt} in equation (1).[4] This is the standard format of the Durbin-Wu-Hausman test. The *p*-value from this test is 0.0139 (F[1,67]=6.39), thus we strongly reject the null hypothesis (at the 95% level) that OLS provides consistent results. Results of the Durbin-Wu-Hausman test indicate that our labor dispute variable ($L_{i'jt}$) is endogenous, that is, it is correlated with a systematic component of the error term in equation (1).

We hypothesize that υ_{jt} consists of a state specific component μ_j and an idiosyncratic component ε_{jt}. Equation (1) is modified to account for this state-specific heterogeneity. This leads to the following:

$$f_{jt} = \gamma_{i'} L_{i'jt} + \beta_i X_{ijt} + \mu_j + \varepsilon_{jt} \qquad (2)$$

Equation (2) is a fixed effects regression that controls for state-specific unobservables (μ_j). The other (exogenous) variables in X_{ijt} that are believed to influence the location of FDI projects across the various states of India include loans from ICICI Bank, loans from EXIM Bank, real value of growth state domestic product, state support for R&D, and other input cost variables such as wage levels and power rates. In the next section, we lay out a strategy for confirming the endogeneity of labor conflict measures.

Section 3.2: Estimating the Endogeneity of Labor Conflict Variables

Consider the following relationship between the labor conflict variable and measures of state-level heterogeneity obtained from the estimation of equation (2) above. In order to be clear that

these are measures of state-level heterogeneity obtained from the estimation of equation (2), they are denoted $\hat{\mu}_j$.

$$L_{i'jt} = \theta_{i''} Z_{i''jt} + \delta_{i'} \hat{\mu}_j + \eta_{i'jt} \qquad (3)$$

Equation (3) shows that the labor conflict variable is a function of a set of exogenous determinants ($Z_{i''jt}$) which include state specific measures such as the literacy rate, the proportion of urban male workers, measures of inequality, regional dummy variables, and the extracted measures of state heterogeneity from equation (2). As long as $\delta_{i'} \neq 0$ in (3), $L_{i'jt}$ is endogenous in (2). Thus an estimation of equation (2) that does not correct for this endogeneity will result in biased and inconsistent measures of $\hat{\gamma}_{i'}$, the true estimated effect of the labor disputes variable on the share of FDI projects in a state.

Since we have observations on variables over time, we estimate equation (2) consistently using a Least Squares Dummy Variable (LSDV) approach.[5] After this, we extract estimates of μ_j (denoted by $\hat{\mu}_j$) from equation (2) for use as independent (right hand side) variables in equation (3). These extracted $\hat{\mu}_j$ are interpreted as latent FDI location propensities for each state j , net of labor and other variables.

A potential problem with the $\hat{\mu}_j$ estimated from equation (2) is that they are likely to be measured with error (Pitt, Rosenzweig, and Gibbons, 1993; Pitt, Rosenzweig, and Hassan, 1990). The nature of the measurement error problem is as follows.[6] If FDI shares and labor regulation variables are measured inaccurately (as they may be), then the derived estimates of $\hat{\mu}_j$ are contaminated with the errors that affect the FDI and labor regulation variables in equation (2). This implies that in measuring the effects of $\hat{\mu}_j$ on labor variables in equation (3), a simple

linear model (such as OLS) leads to inconsistent results. In fact, as is well known, measurement error in a right hand side variable in a least squares framework causes the true effect of that variable to be biased downwards (attenuation bias – the coefficient is biased towards zero).

Consistent estimates may be obtained given errors in variables by using an instrumental variables technique. As noted in Pitt, Rosenzweig, and Hassan (1990), variables that may be used as instruments include repeated observations (over time) on the variable that is measured with error ($\hat{\mu}_j$). Repeated observations on the variable that is measured with error are valid instruments as long as errors are uncorrelated across time periods. Given that there have been no dramatic changes across states in our sample period, we do not believe that the assumption of uncorrelated errors is an overly restrictive one. Furthermore, we present tests for the validity of our instruments below.

Since repeated observations on the measured with error variable may be used as instruments, we instrument for $\hat{\mu}_j$ from 1996-1997 using $\hat{\mu}_j$ from 1998-2000. Equation (3) is then estimated using an instrumental variables technique. A significant $\hat{\delta}_{i'}$ coefficient from the instrumental variables estimation of equation (3) provides evidence that the labor variable in equation (2) is endogenous.

Section 4: Data and Results

Section 4.1: Variables and Data

Table 1(B) provides the sources of the variables used in our estimations.[7] From 1996 to 2000, the total number of FDI projects in India (as reported by the Ministry of Commerce and Industry) was 8,337. Figure 1 depicts shares of FDI projects by state during 1996 – 2000 (our estimations span these years). From the figure, it is clear that most foreign projects locate in Maharashtra, Tamil Nadu, Karnataka, and Delhi.

Section 4.1.1: Labor Conflict Variables. Labor variables capture "on the ground" labor conditions. We consider several alternatives including the number of lockouts, number of strikes, and the number of man-days lost in the state due to work-stoppages. The summary statistics of these variables are provided in Table 1. Figure 2 depicts one of the main labor conflict variables used in the estimations from 1996-2000 (the normalized number of man-days lost due to work-stoppages). In comparing figures 1 and 2, an inverse relationship between new FDI and the pro-worker stance of the state (as captured by the normalized number of man-days lost in disputes resulting in work stoppages) is apparent. This is particularly true for states such as Kerala and West Bengal, which have traditionally favored workers over employers (these states have comparatively large numbers of man-days lost due to disputes in figure 2). As seen from figure 1, the number of new foreign projects that Kerala and West Bengal receive is relatively small.

Section 4.1.2: Indicators of State "Economic Health". We use state-level economic characteristics like gross state domestic product, measures of credit availability such as EXIM bank loans and ICICI bank disbursements, planned outlay by the state on the manufacturing sector, and measures of research and development expenditures by the state government, as indicators of a state's economic health. We hypothesize that FDI prefers to locate in states with relatively high levels of social and economic development. Alternatively, high input costs and poor infrastructure should have negative impacts on location propensities. In order to capture such influences, we use the average daily wage of unskilled male and female workers, the average power rate for large and small industries, and kilometers of surfaced roads available in the state. Other variables that are thought to affect the location of foreign projects include the average Gini for rural and urban areas of the state, the average urban workforce participation rate

for male and female workers, and measures of the availability of a skilled workforce such as enrolments in literacy programs.

We hypothesize that labor conflict variables, variables that measure resource availability, input cost and infrastructure variables, and other indicators of economic development at the state level, have significant effects on the location of foreign projects. In particular, the availability of loans from EXIM and ICICI banks should have a sizeable positive impact on overseas investment since a large number of FDI projects have an export orientation.

Before discussing our results, we note that our estimations are likely to be affected by two main sets of selection issues. First, our data consists of only those FDI projects that were located in the various states of India. If labor conflict deters new investment, a large set of FDI projects may not have been undertaken. Thus we have a non-randomly selected sample and our estimates may reflect sample selection bias. However, this is a conservative bias since our estimates do not capture the negative impact of labor conflict on those projects that were never implemented. Our results thus underestimate the overall deterring effects of labor problems; eliminating the bias should only strengthen the results of our study.

Second, our estimates may be affected by bias resulting from selection on unobservables. Consider two scenarios. First, a foreign firm that has extensive previous experience dealing with labor conflict issues decides the location of a project. The firm may locate the project in a state with relatively more labor problems solely because it is confident of being able to handle future conflicts, given its past experience. We can think of this firm (or project) as being more "able" to cope with labor problems. Since we do not have data on firms' past experience, this variable is unobserved from our perspective. However, the lack of such data may not be too problematic. This is because such unobserved variables lead to an underestimation of the true negative impact

of labor conflict. If we included information on firm's past experience in dealing with labor issues (that is, if we had this information), our results should become stronger.

Alternatively, consider a scenario in which a state has a pro-worker reputation. That is, regardless of the true nature of labor laws, the local government has traditionally favored the worker in labor disputes. Foreign firms may shy away from locating projects in such states even if labor problems are relatively infrequent. Since we do not have information on the "local enforcement history" of states, the results of this study may overestimate the negative impact of labor conflict. However, our use of state fixed-effects controls for the influence of all such unobservables that are state-specific and time invariant. We acknowledge that overestimation of labor conflict's negative effect may still be an issue in the case of unobservables that are not state-specific and time-invariant. Given paucity of data for correcting this in the present study, we hope to account for such concerns in future work.

Section 4.2: Empirical Results

Table 3(A) reports the results of a state fixed-effects estimation that controls for the endogeneity of our labor disputes variable. The dependent variable is the share of FDI projects (in a particular year) received by a state.[8] From column (1) of table 3(A), we find that lagged man-days lost normalized by size of the workforce and the number of lockouts normalized by size of the workforce have significant negative impacts on the share of FDI projects that a state receives. Loan disbursements from ICICI and EXIM banks, and the income level of a state (as measured by gross state domestic product) have strong positive effects on FDI. Planned outlays and research expenditures by states have no significant effects on the dependent variable, although input cost variables such as the average wage of unskilled labor has a significant negative effect

on the share of FDI projects that a state receives. Column (2) reports results for the significant variables of the basic model in column (1).

In columns (3) – (4) of table 3(A), labor conflict variables are normalized by two different parameters. In column (3), labor variables are normalized by the size of the state's manufacturing sector; in column (4), labor variables are normalized by gross state domestic product. In both cases our base results hold, that is, states with relatively high levels of labor disputes receive smaller shares of FDI projects.[9] Results for the other variables in columns (3)-(4) are consistent with those obtained in the basic model of column (1). Table 3(A) also provides measures of the estimated state-specific fixed effects. We observe that for the parsimonious specification of the basic model in column (2), many of the state-specific fixed effects are significant. This underlines the importance of controlling for state-specific unobservables in the estimation (a test that these state-level effects are jointly zero is strongly rejected).[10]

To investigate the influence of state-level heterogeneity on the labor disputes variable, we estimate models similar to the basic specification in table 3(A) separately for 1996-1997 and for 1998 – 2000. Estimates of state fixed-effects are obtained from both sets of regressions. As discussed above, estimates of fixed effects from 1998-2000 are used as instruments for the fixed effects from 1996-1997. The results of the instrumental variables specification are presented in table 3(B). The dependent variable in both columns of table 3(B) is mean man-days lost due to work-stoppage (lagged 1 year) normalized by size of the workforce (mean of the variable taken over 1996 and 1997). The independent variables include instrumented values of the 1996-1997 state-specific fixed effects (identifying instruments are the state fixed-effects from 1998-2000, the average Gini variable for rural and urban areas, normalized expenditures by the state on research and development, and normalized number of research and development projects in the

state), average wage, gross state domestic product, other labor conflict variables, measures for literacy, and dummies for regions of the country that have traditionally been pro-worker in their political orientation. Since the normalized number of lockouts is insignificant in column (1), column (2) reports results for the estimation that excludes this variable.

Both columns of table 3(B) show that the instrumented value of state-level unobservables has a significant negative impact on the labor conflict variable. This confirms that our labor conflict measure is endogenous. Techniques that ignore such correlations will suffer from a downward bias in the labor coefficient, that is, the estimated effect will be smaller than its true value (note that the true effect of the labor conflict variable on shares of FDI is negative).

Various tests of validity for our identifying instruments were conducted. An F-test that these identifying instruments are jointly zero is rejected (F[4,11]=5.58, Probability > F = 0.0106). We also conducted two tests of the overidentifying restrictions. The *p*-value for Sargan N*R-sq test = 0.8231, and the *p*-value for the Basmann test = 0.9707. These *p*-values indicate that the null hypothesis cannot be rejected, that is, our identifying instruments are valid.

Finally, we also investigate whether there are any biases that result from the differing size of state economies. For example, if states with larger economies tend to have larger projects and smaller projects are excluded from our estimations, then spurious correlations could arise. In order to determine whether such a bias is present, we formulate a 'big state' dummy.[11] This dummy takes the value one if a state's industrial gross state product exceeds the median value (over all states). We interact this dummy with the labor conflict variables, and introduce these interaction terms into the basic model of table 3(A). The model thus contains the variables listed in column (1) of table 3(A) along with three additional terms (the interactions of the three labor disputes variables of column (1) with a big state dummy). If systematic differences in labor

unrest by size of the state economy exist, then the interaction terms should be significant. Upon estimating the model, we find that the interactions are insignificant. Hence our estimates do not suffer from bias which results due to the differing size of state economies.

Section 5: Conclusion

This paper investigates the sensitivity of overseas investment to labor conflict across states of in India, using a state fixed-effects approach. We find that foreign direct investment tends to veer away from states that have high incidences of labor conflict, particularly as measured by the number of man-days lost due to work stoppages. Furthermore, results of our fixed effects technique confirm that measures of labor conflicts are endogenous in an analysis of FDI location in India. We find striking evidence that labor disputes across states of India arise in a systematic fashion – state-level heterogeneity measures have significant negative impacts on our labor conflict variable.

This research has important implications for policy. Since FDI brings significant positive benefits, from a purely economic perspective, it may be prudent for state governments to try and reduce the incidence of labor disputes. Moreover, states with low FDI location propensities (either due to poor infrastructure, lack of educated workers, or the presence of a political climate that favors an overly militant workforce) should be provided with adequate incentives by the central government to move to fostering an environment more hospitable to investment from overseas. Such strategies will aid in improving FDI flows to developing countries such as India.

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Notes

1. India started major economic reforms and nationwide liberalization in 1991 in response to a fiscal and balance of payments crisis. These reforms encompassed all major areas – like industrial policy, trade and exchange rate policy, tax reforms and public sector policies.

2. The positive effect of FDI shares is measured imprecisely in column (2) of table 2.

3. In this context, it is important to note that labor laws are subject to manipulation by state governments, but variables such as ICICI and EXIM loans (which we use as proxies of a state's overall "economic health") are not. These variables are thus considered to be exogenous in our estimations. Note that our use of a state fixed-effects approach corrects for bias resulting from state-level time-invariant omitted variables; we are thus confident that such biases do not affect variables in the estimation that are treated exogenously.

4. Region 1 (north) includes Haryana, Punjab, Rajasthan, Uttar Pradesh, and Delhi. Region 2 (south) includes Andhra Pradesh, Kerala, Tamil Nadu, and Karnataka. Region 3 (east) includes Bihar, Orissa, and West Bengal. Region 4 (west) includes Gujarat, Madhya Pradesh, and Maharashtra. Region 5 (other) includes Arunachal Pradesh, Jammu & Kashmir, Mizoram, Nagaland, Sikkim, Himachal Pradesh, Assam, Tripura, and Meghalaya.

5. The LSDV model is equivalent to a state-fixed effects model.

6. Pitt, Rosenzweig, and Hassan (1990) provide a detailed discussion of how the measurement error problem arises on pp. 1145-1146.

7. We mention the original sources for the majority of our data, even though we use the electronic versions put together by Indiastat, a web based data vendor specializing in Indian data.

8. In an alternative specification, we used the share of total new FDI investment the state receives as the dependent variable. In general, labor dispute variables (particularly man-days lost due to work-stoppage normalized by size of the workforce) exerted negative effects on the share of FDI investment at the state level. We report results of estimations that use the share of FDI projects at the state level as the dependent variable, since these results are more robust.

9. In column (3), normalized number of strikes appears to increase the share of FDI projects that a state receives. This is counterintuitive, and is probably due to the high degree of correlation between the labor variables in column (3). The normalized number of lockouts in column (4) also has a positive effect; this is similarly explained.

10. $F[16,58]=75.91$, Probability > F = 0.0000.

11. Big state dummy = 1 if state industrial GSP is greater than the median.

Table 1
Summary Statistics (1996 – 2000)

Variable	Obs.	Mean	Std. Dev.	Min	Max
Dependent variables					
Number of FDI projects norm. by GSDP	80	0.199	0.245	0.000	1.041
Share of FDI projects	80	0.062	0.068	0.002	0.298
Net value added in state norm. by GSDP	80	1840.41	1720.72	547.82	9781.82
Net income of state	80	382249.8	548769	0.000	2668724
Mean (1996-97) man-days lost due to work-stoppage(lag1yr) norm. by size of workforce	16	0.003	0.002	0.001	0.007
Regressors					
Labor variables (normalized by size of workforce)					
Man-days lost due to work-stoppage(lag1yr)	80	0.003	0.004	0.000	0.033
Number of lockouts	80	0.0001	0.0001	0.000	0.0004
Number of strikes normalized by	80	0.0001	0.0001	0.000	0.0002
Labor variables (normalized by size of state's manufacturing sector)					
Man-days lost due to work-stoppage(lag1yr)	80	8.298	11.903	0.000	77.065
Number of lockouts	80	0.202	0.254	0.000	1.556
Number of strikes	80	0.285	0.194	0.013	0.876
Labor variables (normalized by state's GSDP)					
Man-days lost due to work-stoppage(lag1yr)	80	2.003	2.869	0.000	18.879
Number of lockouts	80	0.152	0.738	0.000	6.135
Number of strikes	80	0.044	0.064	0.000	0.299
Variables that measure resource availability (normalized by state's GSDP)					
ICICI disbursement	80	17.229	19.503	1.151	114.250
EXIM loans	80	0.042	0.047	0.0000	0.228
Planned outlay by state on manufacturing	80	22.561	19.166	2.572	84.326
Expenditures on R&D by state	80	11.096	6.144	0.000	25.712
Number of R&D projects	80	0.3110	0.629	0.000	3.350
GSDP	80	616.16	403.23	31.624	2007.85
Input cost and infrastructure variables					
Avg. wage(male & female) unskilled labor	80	47.200	13.385	26.163	96.250
Avg. power rate(large & small) industries (lag.1 yr)	80	336.88	67.031	169.215	480.704
KM of surfaced roads(norm. by area of state) (lag. 1 year)	80	1.376	3.782	0.000	16.288
Other variables					
Avg. Gini for rural and urban areas (lag1yr)	80	0.279	0.017	0.228	0.315
Average urban workforce participation rate for males and females (lag.1yr)	80	32.638	2.986	24.413	39.275
Enrolment in literacy program(per1000 pop)	80	124.01	103.97	0.000	761.583
Dummy for southern states	80	0.250	0.436	0.000	1.000
Dummy for eastern states	80	0.188	0.393	0.000	1.000
Fixed effects					
State fixed-effects from 1996-1997	16	-0.109	0.077	-0.361	-0.027
State fixed-effects from 1998-2000	16	0.014	0.053	-0.035	0.170

Table 1(B)
Variables That Are Available From 1996-2000 With Their Sources

Variables	Source
FDI projects by state	SIA Newsletter 2001 Annual Issue, Ministry of Commerce & Industry, GOI
Number of lockouts, strikes	Rajya Sabha Starred Question No. 196, 08.03.2001
Man-days lost due to work-stoppage	Pocket Book of Labour Statistics 2000, GOI
EXIM bank loans	Report on Development Banking in India 2000-01, IDBI
ICICI bank disbursement	Rajya Sabha Unstarred Question No.1794, 8.8.2000
Planned outlay by state on manufac.	Handbook of Industrial Policy and Statistics, GOI, 2000
Gross state domestic product	Central Statistical organization
No/Expenditure:R&D projects by state	R&D Statistics - Ministry of Science and Technology
Net value added, Net income of state	Annual Survey of Industries (1996-2000)
Avg. daily wage for unskilled workers	Building Material Prices and Wages of Labour, GOI.
Average power tariff for industries	Rajya Sabha Unstarred Question No. 845, 24.07.2002.
Kilometers of surfaced roads	Basic Road Transport Statistics of India, Govt. of India
Average Gini for rural and urban areas	National Human Development Report 2001, GOI.
Avg. urban workforce part. rate	India Yearbook 2002, Manpower Profile.
Enrolment in literacy program	Annual Report 1998-99, Ministry of Human Resource, GOI
Industrial GSP, GSDP	Central statistical organization
Total workforce	2001 Census, GOI
Population in Thousands (1996-2000)	Population Projections for India and States 1996-2016, GOI
Area in Square Kilometer (1996-2000)	1991 Census, GOI

Table 2
Effect of FDI on Selected State Outcomes

Variable	Net Value Added (normalized by GSDP)	Net Income of State
	(1)	(2)
Number of FDI projects normalized by GSDP	945.26255#	
	(508.55880)	
Share of FDI projects		3345080
		(4249360.00000)
Man-days lost due to work-stoppage (lagged 1 year) normalized by GSDP	-3.16825	-3158.31205
	(51.58542)	(37917.00315)
Planned outlay by state on manufacturing normalized by GSDP	33.21648**	-3984.39995
	(7.86574)	(5945.84403)
Constant	909.25230**	269399.0343
	(232.24996)	(345177.91568)
Observations	80	80
Number of state fixed-effects	16	16
R-squared	0.274	0.024

A linear state fixed-effects model is used to estimate the above specifications. Data range from 1996-2000. Standard errors in parentheses. # Significant at 10%; * significant at 5%; ** significant at 1%.

Table 3(A)
Fixed Effects Estimation: Basic Model & Sensitivity Analyses

Variable	Basic Models		Sensitivity Analyses	
	(1)	**(2)**	**(3)**	**(4)**
Man-days lost due to work-stoppage	-0.97187**	-1.01394**		
(lag.1 yr) norm. by size of workforce	(0.31892)	(0.23688)		
Number of lockouts normalized by	-54.52534*	-41.82276#		
size of workforce	(24.04185)	(24.92590)		
Number of strikes normalized by	0.63088			
size of workforce	(50.88053)			
Man-days lost due to work-stoppage			-0.00053**	
(lag1yr) norm. by size of manuf. sector			(0.00017)	
Number of lockouts normalized by			-0.01734**	
size of state's manufacturing sector			(0.00563)	
Number of strikes normalized by			0.02775#	
size of state's manufacturing sector			(0.01457)	
Man-days lost due to work-stoppage				-0.00166*
(lag. 1 year) norm. by GSDP				(0.00075)
Number of lockouts normalized by				0.00604*
GSDP				(0.00264)
Number of strikes normalized by				-0.02276
GSDP				(0.02664)
ICICI disbursement normalized by	0.00054**	0.00048**	0.00054**	0.00064**
GSDP	(0.00012)	(0.00012)	(0.00012)	(0.00012)
EXIM loans normalized by GSDP	0.13941**	0.14613**	0.12982**	0.09522#
	(0.05159)	(0.05042)	(0.04689)	(0.05191)
Planned outlay by state on	-0.00004		0.00002	-0.00021
manufacturing norm. by GSDP	(0.00019)		(0.00017)	(0.00018)
Gross state domestic product (GSDP)	0.00007*	0.00008*	0.00007#	0.00007*
	(0.00003)	(0.00003)	(0.00004)	(0.00003)
Expenditures on R&D by state	-0.00125		-0.00165	-0.00175
normalized by GSDP	(0.00117)		(0.00112)	(0.00106)
Average wage for male and female	-0.00044#	-0.00052*	-0.00039	-0.0003
unskilled labor	(0.00027)	(0.00023)	(0.00026)	(0.00026)
Average power rate for large and	0.00002		0.00003	0.00003
small industries (lag. 1 year)	(0.00004)		(0.00003)	(0.00004)
Average Gini for rural and urban	0.17783		0.13172	0.35981*
areas (lag. 1 year)	(0.15940)		(0.14958)	(0.16976)
Avg urban workforce participation rate	-0.00028		-0.00034	-0.00074
for males and females (lag. 1 yr)	(0.00087)		(0.00093)	(0.00097)
Kilometers of surfaced roads	-0.00037		-0.00012	-0.00138
(norm. by area of state) (lag. 1 year)	(0.00209)		(0.00175)	(0.00213)
Enrolment in literacy program	0.00001		-0.000003	0.00004#
(per thousand of population)	(0.00002)		(0.00002)	(0.00002)

Range:1996-2000. Dep. var is share of FDI. Robust SE in parenthesis. # Significant at 10%; * at 5%; ** at 1%.

Table 3(A) continued
Fixed Effects Estimation: Basic Model & Sensitivity Analyses

Variable	Basic Models		Sensitivity Analyses	
	(1)	**(2)**	**(3)**	**(4)**
Andhra Pradesh Dummy	-0.02517	0.0078	-0.00494	-0.06111
	(0.05325)	(0.02244)	(0.05425)	(0.05078)
Bihar dummy	-0.04422	-0.01055	-0.03286	-0.08297#
	(0.04346)	(0.01282)	(0.04428)	(0.04311)
Gujarat dummy	-0.02361	-0.00319	-0.01252	-0.04885
	(0.05774)	(0.02087)	(0.05889)	(0.05235)
Haryana dummy	0.01809	0.04171**	0.02449	-0.01174
	(0.04910)	(0.01084)	(0.05049)	(0.04758)
Karnataka dummy	0.04411	0.08045**	0.05472	0.00724
	(0.05069)	(0.01714)	(0.05144)	(0.04909)
Kerala dummy	0.0004	0.02694#	0.01335	-0.03109
	(0.04585)	(0.01389)	(0.04758)	(0.04629)
Madhya Pradesh dummy	-0.05951	-0.02086	-0.04777	-0.09774#
	(0.05114)	(0.01778)	(0.05177)	(0.04897)
Maharashtra dummy	0.08931	0.11810*	0.10912	0.05769
	(0.07561)	(0.04971)	(0.07750)	(0.06832)
Orissa dummy	-0.02778	0.00399	-0.01992	-0.0638
	(0.04369)	(0.00824)	(0.04477)	(0.04484)
Punjab dummy	-0.02447	0.00409	-0.01136	-0.05838
	(0.04646)	(0.01150)	(0.04754)	(0.04588)
Rajasthan dummy	-0.04078	0.00017	-0.03579	-0.08095#
	(0.04334)	(0.01239)	(0.04472)	(0.04475)
Tamil Nadu dummy	0.05951	0.09483**	0.06617	0.02419
	(0.05418)	(0.02227)	(0.05608)	(0.05076)
Uttar Pradesh dummy	-0.06353	-0.02859	-0.04766	-0.10202#
	(0.06427)	(0.03431)	(0.06552)	(0.05907)
West Bengal dummy	-0.031	0.00984	-0.01227	-0.0736
	(0.05018)	(0.02029)	(0.05175)	(0.05007)
Other dummy	0.00142	0.02677**	0.00726	-0.04066
	(0.04019)	(0.00996)	(0.04143)	(0.04541)
Delhi dummy	0.04054	0.08657**	0.0421	0.00324
	(0.04818)	(0.01230)	(0.04769)	(0.05208)
Observations	80	80	80	80
R-squared	0.992	0.991	0.992	0.992

Data range = 1996-2000. Dependent variable is share of FDI. Robust standard errors in parenthesis.
Significant at 10%; * significant at 5%; ** significant at 1%.

Table 3(B)
Instrumental Variables Results for Labor Conflict (1996-1997)

Variable	(1)	(2)
Instrumented state fixed effect from 1996-1997	-0.02533#	-0.02183#
	(0.01533)	(0.01171)
Average wage for male and female unskilled labor	0.00007	0.00007
	(0.00009)	(0.00008)
Gross state domestic product	0.00001*	0.00001*
	(0.000004)	(0.000003)
Enrolment in literacy program (per thousand of population)	0.00003*	0.00003**
	(0.00002)	(0.00001)
Dummy for southern states	0.00131	0.00101
	(0.00167)	(0.00107)
Dummy for eastern states	0.00305	0.00298
	(0.00274)	(0.00242)
Loans disbursed by ICICI norm. by GSDP	-0.00006	-0.00006
	(0.00005)	(0.00004)
Number of strikes normalized by size of workforce	36.02684#	34.30241#
	(20.49070)	(18.47100)
Number of lockouts norm. by size of workforce	-5.70305	
	(21.89861)	
Constant	-0.01562#	-0.01491#
	(0.00865)	(0.00808)
Observations	16	16
R-squared	0.388	0.44

Dependent variable is mean man-days lost due to work-stoppage (lagged 1 year) normalized by size of workforce (mean of the variable taken over 1996 and 1997). Southern states include Andhra Pradesh, Kerala, Tamil Nadu, and Karnataka. Eastern states include Bihar, Orissa, and West Bengal. Robust standard errors in parentheses.
Significant at 10%; * significant at 5%; ** significant at 1%.

Tests of Instrument Validity:

1. Identifying instruments include the derived state fixed-effect from 1998-2000, the average Gini for rural and urban areas, normalized expenditures by the state on R&D, and the normalized number of R&D projects in the state. An F-test that these identifying instruments are jointly zero is strongly rejected (F[4,11]=5.58, Probability > F = 0.0106).

2. Tests of overidentifying restrictions: *p*-value for Sargan N*R-sq test = 0.8231, and *p*-value for Basmann test = 0.9707. Thus, the null hypothesis cannot be rejected, which implies that our identifying instruments are valid.