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Labor Disputes and the Economics of Firm Geography:

A Study of Domestic Investment in India[**]

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Abstract

Acrimonious relations between employers and employees in developing countries have often been cited as impediments to progress. This paper considers various measures of labor disputes, and investigates whether these have detrimental effects on the location choice of new domestic investment across the various states of India. Conventional wisdom holds that an increase in measures such as the number of strikes, the number of man-days lost in work-stoppages, and the percentage of unionized workers, would hinder the location of new projects. Using panel data and a fixed effects methodology that controls for the effect of state-specific unobservables, we find significant evidence that this is indeed the case in India. Furthermore, disaggregation by industrial classifications shows that although labor disputes continue to exert negative effects, location choices are also conditioned on factors such as proximity to raw materials and minerals.

Section 1: Introduction

Rapid economic growth is perceived as a panacea for developing nations. Hence in the interest of increasing the pace of development, countries have begun to re-examine the way they do business. Governments in developing countries talk about reforming laws and removing roadblocks, in order to usher in a golden age of domestic and foreign investment. Reforms in various spheres including the financial sector, taxation, agriculture, industrial policy, pollution regulation, infrastructure, intellectual property rights, and labor laws are needed to enhance global competitiveness. A detailed study of this issue is important in order to get a clear view of the link between regulations and investments. In this research, we study the effect of labor conflict and formal labor laws on new investment in the various states of India. We find that labor disputes and pro-worker legislations inhibit location choice and new investments.

With the initiation of liberalization policies and economic reforms in India in 1991[1], the role of private investment in economic growth has gained significant importance. States now compete with one another to attract new investment. In such inter-state competition, environmental and labor regulations are key. In the context of developed economies, there is a large theoretical and empirical literature on the effect of regulations on a firm's location and investment decision. However, there is a paucity of research on this topic in the context of developing countries. One of the few exceptions is Besley and Burgess (2002). They find that movements towards pro-worker policies were "associated with lower levels of investment, employment and output" for Indian manufacturing industries. However, to the best of our knowledge, no study has considered how labor conditions in a state affect firm incentives at a micro level. By analyzing the impact of amendments to the Industrial Disputes Act of 1947 (our

[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 – industrial policy, trade and exchange rate policy, tax reforms, and public sector policies.

measure of formal labor legislation) and the influence of labor conflict on new investment, we address this gap in the literature.

Labor regulations encompass a wide variety of laws ranging from those formulated to ensure the health and safety of workers to those aimed at resolving industrial disputes. The former category includes policies on minimum wages, work hours, and health and safety standards for factories. The second broad category of labor laws is aimed at ensuring the rights of both workers and employers. These deal mainly with the rights of workers to unionize, collective bargaining processes, layoff policies, mechanisms to resolve disputes, and policies on strikes and lockouts. The focus of this analysis is how the latter set of factors affects the input costs of firms, and hence, the location of new projects across the states of India.

Our analysis of firm location choice provides striking results. We find that measures of labor conflict such as the state-wise number of lockouts, percentage of unionized workers, and the number of man-days lost in disputes resulting in work stoppages, all have strong negative impacts on new investment. Our results are robust to the inclusion of variables such as a Gini inequality measure and various other measures of input costs and state infrastructure. Results are also unaffected when we condition on institutional labor legislation and account for project characteristics. Finally, we estimate a more flexible specification that allows us to model the fact that certain industries are constrained by their need for proximity to sources of raw materials and minerals. We find that such considerations are particularly important for new projects in mining and agricultural industries.

The paper consists of six main sections. Section 1 introduces the topic of this research and section 2 provides a literature review. The third section gives an overview of the data,

whereas the fourth section discusses our empirical methodology. Section 5 reports our results and the last section concludes. All tables and graphs are in the appendix of the paper.

Section 2: Literature Review

Section 2.1: Investment and Location Choice

We start by focusing on the body of literature on determinants of location decisions. While none consider labor conflict per se, these studies provide useful insights into factors that may retard or encourage new investment. Most employ conditional logit models to study a firm's location choice. The explanatory variables include institutional and regulatory factors, economic parameters, and indicators of the existing industrial environment – all of which affect the firm's operating costs. In general, environmental regulations, wages, energy costs, property value, and unemployment, all have negative impacts on location probabilities; whereas population and better infrastructure have positive impacts (Wolverton 2002, List and Co 2000, Levinson 1996, and McConnell and Schwab 1990). Additionally, recent work (Keller and Levinson 2002) has found that pollution abatement costs have deterring effects on foreign direct investment across states of the U.S.

In terms of labor measures specifically, results are mixed. For example, the presence of unions increases the collective bargaining power of workers and raises wages – this factor should negatively affect location decisions. But evidence for the US ranges from a positive and significant relationship between the percentage of unionized workers and location choice probabilities (List and Co 2000), to no relationship (McConnell and Schwab 1990), to significant negative impacts of unionization (Bartik 1985). However, differences in right-to-work laws

across U.S. states are found to have strong effects, with more "pro-business" states attracting the lion's share of manufacturing activity (Holmes 1998).

In the case of developing countries, Kuncoro (2000) has found similar effects of wages and infrastructure on the location decisions of firms in Indonesia. For India, Mani, Pargal and Huq (1997) fail to find evidence that environmental policies affect a polluting firm's location decision. They explain the insignificance of their results by arguing that other factors may be important determinants of project location choice. One such factor is labor laws.

Section 2.2: State-Level Regulatory Environment in India

Labor laws in India[2] are all-encompassing and have far-reaching impacts upon the industrial climate of the country. Heterogeneity in labor regulations at the state level arises from two sources. First, depending on the nature of the government in power, states pass amendments to labor laws that are more pro-worker or more pro-employer than the central government law. Our discussion of such amendments is based on Besley and Burgess (2002), who rate state labor law amendments (to the Industrial Disputes Act of 1947) from 1958-1990 and code each as neutral, pro-worker, or anti-worker[3]. Second, the implementation of laws may be affected by other considerations. For example, in a state like West Bengal, the Communist party has been in

[2] The Factories Act of 1948 and the Industrial Disputes Act of 1947 are the two most important acts that govern working conditions in factories and provide a mechanism for the settlement of industrial disputes. The former seeks to set standards for safe working conditions; mandates working hours and vacation and overtime policy; and sets health and safety standards. This Act, along with the Equal Remuneration Act of 1976, the Minimum Wages Act, the Payment of Bonus Act, and the Maternity Benefits Act; constitute the backbone of the labor laws in India today. The Industrial Disputes Act of 1947 and the Trade Unions Act seek to protect the worker from being exploited by the employer. The former provides guidelines for settling disputes, and also lays out conditions under which a worker may be laid off and the various ways of redressing the situation. The latter grants workers the right to unionize and outlines certain protections and privileges that union members would enjoy. Although these acts apply to all states in India, their efficacy depends on the political will of each state government.

[3] A complete summary of all the amendments and the coding is available at http://econ.lse.ac.uk/rburgess. A pro-worker amendment is coded as one, a neutral amendment as zero, and an anti-worker amendment is coded as negative one.

power for the past twenty years. The pro-worker bias of the party may affect outcomes of collective bargaining, disputes, and strikes, even without any formal changes in labor policies at the level of the state government.

Although recent work has shown that stringent pro-worker regulations have negative impacts on the economic performance of states in India (Aghion, Burgess and Redding 2002, Besley and Burgess 2002, and Bajpai and Sachs 2000), no study has considered how labor conflict at the state level influences the location decisions of new projects in India. By analyzing this question using a fixed effects conditional logit methodology, this paper contributes to the research on the economics of firm geography in developing countries.

Section 3: Data

The data used in this study are from two primary sources - Center for Monitoring the Indian Economy (CMIE) and Indiastat. The CMIE data set tracks every major[4] new investment made in India from July 1995, and has information on the location of new projects, their start date, as well as other project characteristics such as status (proposed, under implementation, completed), ownership (private Indian, private foreign, state govt., central govt., joint sector, cooperative sector), type (new unit, substantial expansion, renovation/modernization, rehabilitation) and industrial classification.

Our study focuses on the 1997-1999 time period. The estimation sample in our research comprises of only private domestic projects that are either under implementation or have been completed. We exclude projects in the service and irrigation sectors, and include those in manufacturing, mining, agriculture, and electricity, gas, and water sectors (see tables 1(d), 1(e), and 1(f)). Our sample thus consists of 637 projects over our time span of interest. In our data,

[4] Usually 40 lakhs and above (approximately 80,000 dollars)

the mean investment (for the 1997-1999 time period) is 158 crore[5] rupees (approximately 32 million dollars).

Our independent state-level variables are obtained from the Indiastat[6] database, and vary by state and year. Indiastat is an online data service that contains time-series data on labor regulation variables, as well as information on economic, social, demographic, and political variables, both at an all-India level and at the state level. Table 1(a) provides the summary statistics of all variables used in our study, and table 1(b) provides the original data sources for the variables used in our panel estimations.

Section 3.1: Location Choice

During the period we consider, the geo-political map of India has undergone dramatic changes. Three new states have been carved out of old ones – Jharkhand was originally a part of Bihar, Chattisgarh was a part of Madhya Pradesh, and Uttaranchal originated from Uttar Pradesh. For our purpose, we classify these new entities under their original states. We also code union territories under the closest (by distance) state. For example, Dadra and Nagar Haveli is indistinguishable in terms of socio-economic characteristics from Gujarat; thus projects here are coded as having located in Gujarat. Similarly Chandigarh is classified under Punjab; Goa, Daman, and Diu are coded under Maharashtra; and Pondicherry is coded under Tamil Nadu. A detailed list of the coding is reported in table 1(c).

In our estimation, each project has the option of choosing amongst 16 different locations. These include the fourteen states in India that have a substantial industrial presence, the union territory of Delhi, and a catchall category that includes other states (as seen from table 1(c)). Our

[5] 1 crore=10000000
[6] This data can be found at www.indiastat.com

choice of these locations is motivated by the Besley and Burgess (2002) study. We assume that for a new project, the site location address is the most relevant[7].

Graph 1 shows the distribution of projects among the various states, where the number of projects is normalized by gross state product (GSP) attributable to the industrial sector. As is evident from Graph 1, Maharashtra is at the forefront of receiving new investments[8], followed by Karnataka, Haryana, Tamil Nadu, and Gujarat.

Section 3.2: Labor Regulation Variables

We consider two categories of labor variables – (i) indicators of labor conflict such as the number of strikes and lockouts, as well as the percentage of unionized workers, and (ii) state level amendments to the Industrial Disputes Act (IDA) of 1947. For the first set of labor measures, we create dummies for whether the value of the variable exceeds the median value in a particular year. This is done to capture the idea that when locating a project, a firm is interested in whether a particular state lies above or below the median value in terms of various measures of labor unrest, rather than the absolute level of conflict. Graph 2 shows the number of lockouts and man-days lost due to disputes, normalized by size of the labor force in a state. Upon comparing the two graphs, a negative relationship between new investment and labor conflict is evident.

The second category of labor variables includes formal amendments to labor laws at the state level. These amendment classifications are based on coding developed by Besley and

[7] The registered office address is usually the location of the central office, which is often predetermined in India. When large conglomerates and private business houses like the Tatas and Ambujas started in the early post-independence era, they generally located the central offices in the home states of the entrepreneurs. But for profit-maximizing firms, the location decisions of new projects should be influenced by political, regulatory, and economic considerations in the local siting area. Thus, our location variable is derived from the site address of the project.
[8] The "other" state category appears to be unusually large in Graph 1. This is because the industrial gross state product for these states is comparatively low.

Burgess (2002), where each amendment is categorized as pro-worker, pro-employer, or neutral. Instead of using the authors' categorization, we first use share of pro-worker amendments (from 1949 – 1990) per state. Adopting this method allows us to control for the amount of labor-related legislative activity in a state, particularly activity that is anti-employer. We believe that for example, a state that passes 6 pro-worker amendments amongst a total of 25 amendments is viewed in a different light as compared to a state that passes 6 pro-worker amendments amongst a total of 10 amendments. Second, we study two particular characteristics of such amendments – the right to strike[9] and the provision of severance pay[10]. Once again we use information on amendments to the Industrial Disputes Act of 1947 to create these variables[11]. These dummies take the value one if a particular state has passed the related amendment in question.

Section 3.3: Other Variables of Interest

In addition to labor indicators, other factors could potentially influence location choice. Important among these are input costs, since wages and power tariffs compose a large part of the daily operating costs of most projects. Wages are measured by the average[12] daily wage rate for urban unskilled workers lagged by 3 years. In India, power rates vary by the size of the industry and also by the usage - the so-called declining block tariff. We use the average tariff for medium and large industries (lagged by 1 year) for estimation purposes. The choice is dictated by the

[9] States that have passed a right to strike amendment: Andhra Pradesh, Karnataka, Rajasthan, West Bengal.
[10] States that have passed a severance pay provision amendment: Andhra Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Rajasthan, Tamil Nadu, West Bengal.
[11] We note that each state amendment is passed at a different point in time. Therefore, if a state passes a right to strike law, say in 1960, and has not repealed it till 1990, then it gets a one throughout the sample period. Similarly, a state passing such a law in 1990 still gets a one for the entire period.
[12] This is the average daily wage for males and females combined. The choice of the lag is dictated by data availability. We did not use contemporaneous data because of endogeneity concerns.

observation that most projects in our sample fall under these two industrial categories, when classified in terms of power consumption[13].

Other economic explanatory variables include growth rate of industrial gross state product (GSP), an urban Gini coefficient (lagged by 1 year), and EXIM (Export-Import) bank funding. We believe that for India, the growth rate of industrial GSP serves more as an indicator of the overall health of the state, rather than as a gauge of market size. For most products, firms consider their market to be the all-India market. The urban Gini coefficient (for per capita consumption expenditure) measures income inequality in the state. Investors may choose to move to states with a low inequality index since this may signal a better overall "economic" climate.

Location decisions may also be influenced by the availability of skilled labor and the level of infrastructure in a state. Thus, we include measures of state literacy, urban workforce participation rates (lagged by 1 year), and road length (lagged by 1 year) in our estimations. Literacy measures are important because they proxy for labor efficiency and productivity. The workforce participation variable is an indicator of the size of the labor force. This variable should affect location choice probabilities positively, as labor availability eases pressure on wages and thus decreases input costs. The next section discusses our methodology and provides intuition for the models we use.

Section 4: Empirical Strategy

We begin by obtaining a preliminary understanding of the relationship between new investments and labor conflict. In order to do this, we estimate two sets of panel data models.

[13]Our main results remain unchanged when we alternatively control for the tariff rates of small and large industries in our specifications.

The first set evaluates the determinants of the total number of new projects in a state, where one of the determinants is a measure of labor disputes. The second set considers determinants of the total value of new investments within a state; again, one of the determinants is a measure of labor disputes. State-fixed effects are present in both sets of panel data models to control for other state-level factors that may influence the dependent variable, but on which we have no information. These omitted variables may lead to spurious correlations between our labor disputes measure and the error term; that is, our labor disputes variable may be endogenous. In the absence of a correction, this endogeneity would bias our results. The use of state-fixed effects helps us control for the influence of other state-level time-invariant factors absent from our specification. State-fixed effects thus correct for the endogeneity of our labor disputes variables which arises due to missing data. Moreover, states of India differ dramatically in terms of resource availability, cultural heritage, population characteristics, and infrastructure. Our use of fixed effects helps us account for state-level differences that do not vary over time. Hence, we estimate two sets of state-fixed effects models in our preliminary investigation of the relationship between new investment and labor conflict. The first set utilizes state-fixed effects negative binomial (count) models (with robust standard errors); the second set estimates linear state-fixed effects models. These results are presented in table 2.

After our preliminary study, we analyze project location decisions in greater detail. We employ conditional logit models in order to accomplish this. The intuition behind our use of the conditional logit model is as follows. We hypothesize that a firm makes a single decision (the state in which the project should be located) among several alternatives (the sixteen locations noted in table 1(c)). In making this decision, firms consider the attributes of each location. They then formulate implicit equations that correspond to each of the sixteen locations. Each of these

location-specific equations measures the net profit of situating the project in that location. Firms choose to situate the project in the location (state) where the net profit is the largest. Following McFadden (1973), we arrive at the conditional logit model by making two assumptions regarding the error terms of the implicit profit equations[14]. Most other studies on location choice have also used conditional logit specifications. Our use of this category of models is thus in keeping with the literature.

As detailed above, we use a conditional logit framework to study project location decisions. The conditioning is at the project level as each project in our data is given the choice of locating in one of sixteen states. We hypothesize that one major factor that determines project location is the incidence of labor disputes in a state. As noted above, unobservables (and state-level heterogeneity) may lead to the endogeneity of this labor disputes variable. We control for this by using state-fixed effects. Thus, we study project location decisions in a state-fixed effects conditional logit framework using data from 1998-1999. Since there may be multiple projects located in a state, the standard errors of our point estimates are adjusted for clustering at the state level. These results are reported in tables 3(a) – 5.

The next section reports and discusses the results of our various specifications.

Section 5: Results

Section 5.1: Preliminary Analysis

As noted above, in order to obtain a preliminary sense of the relation between new investment and state-level labor regulations, we estimate two sets of panel data models for 1994 – 1999. Results are as reported in table 2. The first two columns depict estimates for fixed

[14] As noted in Greene (2003), these assumptions are that the error terms are independent and identically distributed, and that they follow the type I extreme value (Gumbel) distribution.

effects negative binomial (count) models. The dependent variable in columns (1) and (2) is the total number of new projects in a state. Columns (3) and (4) report results for linear fixed effects models, where the dependent variable is the value of total new investment in a state. As is clear from columns (1) – (4), (normalized) number of lockouts has a strong negative effect on new projects and new investment within states. Hence, there is preliminary evidence that labor conflict has deterring effects on new investment.

From column (1) of table 2 we observe that the growth rate of income in a state has a positive and significant effect on the total number of new projects. The male wage variable has expected effects but contrary to intuition, a rise in female wages increases the number of new projects. This may be partly explained by the fact that wages proxy for workforce efficiency and equality. Column (2) is a parsimonious form of the model in column (1). As is clear, expected results obtain.

In the linear fixed effects model of column (3), we find that credit availability and the growth rate are not significant factors in explaining the magnitude of new investment in a state. Column (4) is a parsimonious form of the linear fixed effects model with variables that correspond to those in column (2). Again, expected results obtain. In summary, results of table 2 confirm our hypothesis that labor conflict has negative effects on new investments. Next, we investigate the firm's location decision at the micro-level.

Section 5.2: Conditional Logit Estimation

Following the literature on location choice theory, a conditional logit model[15] is estimated for the 1998-1999[16] time period. As discussed above, a firm is given the choice of

[15] This is not a repeated choice model where we observe the same entity making choices across different years. In our case, the decision is made at the project level and each project enters the sample only once.

locating its project among sixteen alternative states. Project location choice is influenced by state-level labor regulation and conflict variables, costs of inputs, socio-economic variables such as an urban Gini coefficient, and other variables that include measures of credit availability in the state. These variables are believed to affect the net profits of projects, and will thus influence location decisions. Our use of the conditional logit model presumes that a project is sited in the state where net profits are the highest. The total number of projects over the 1998-1999 time period is 437, and, as noted above, the total number of location choices is sixteen. We include both state and year specific, as well as project specific variables in our estimations.

The conditional logit is modeled on the assumption of independence of irrelevant alternatives (IIA). This assumption does not allow for correlation across the unobservables of the sixteen net profit equations. This assumption is clearly a strong one to make, since profits may be correlated across states and regions. The conventional technique to relax the IIA assumption is to introduce regional dummies (see Bartik 1985). However, since regional dummies do not vary over years, they are not identified in our state-fixed effects framework. We account for correlations in location decisions by introducing dummies and their interactions in our framework.

Before discussing our results, we note that the conditional logit estimations are likely to be affected by two main sets of selection issues. First, our data consists of only those projects that were located in the various states of India. If labor conflict deters new investment, a large set of 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

[16] The choice of the sample period is dictated by data availability. The majority of the variables of interest were available for mainly these two years.

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 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 firm's 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. 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. Hence, lack of data on state-specific information that is constant over time should not bias the results of this research. 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 5.3: Basic Model & Sensitivity Analysis

Section 5.3.1: Labor Conflict Results

Table 3(a) shows the results from the basic model. Table 3(b) is a robustness check for the estimates obtained in table 3(a). As hypothesized, number of lockouts (normalized by workforce in a state in that year), the lockout dummy, the work-stoppage dummy, and the percentage of unionized workers, all have significant negative effects on location choice probabilities. All tables report coefficients and not elasticities, unless specified otherwise. As discussed earlier, the labor conflict dummies in table 3(b) are constructed such that the dummy takes a value of one if the conflict variable exceeds its median value across all states for that year. The negative coefficients on these dummies in table 3(b) imply that projects are less likely to be located in states that lie in the upper half of the labor conflict distribution.

To get a better idea of the magnitude of the effects of the variables in the basic model of table 3(a), we calculate own-and cross-elasticities[17]. The elasticities enable us to judge to what extent and by how much each of these variables affects location choice probabilities. The interpretation of own-and cross-elasticities is similar to the interpretation of elasticities in the standard price-elasticity framework. Own-elasticity measures the "responsiveness of an individual's choice probability to a change in the value of some attribute" (Ben-Akiva and

[17] To calculate the own-and cross-elasticities, we proceed in the following manner. We first calculate individual elasticities and then calculate their weighted average using choice probabilities as weights. Suppose there are "i" locations to choose from, "n" projects that are choosing between these locations, and "k" regressors or attributes.

Then disaggregate own elasticity is given by: $E_{x_{ink}}^{P_n(i)} = [1 - P_n(i)]x_{ink}\beta_k$ --- (1)

where $P_n(i)$ is the probability of a particular project "n" choosing location "i", x_{ink} is the attribute of interest[17], and β_k is the coefficient on attribute k from the conditional logit model.

Therefore, aggregate own-elasticity is given by: $E_{x_{jk}}^{\bar{P}(i)} = \sum_{n=1}^{N} P_n(i) E_{x_{jnk}}^{P_n(i)} \Big/ \sum_{n=1}^{N} P_n(i)$ --- (2)

Aggregate cross-elasticity can be calculated in an analogous manner.

Lerman 1985). Similarly, cross-elasticity shows the responsiveness of an individual's probability of choosing location *i* when the value of some attribute changes in location *j*. Column (2) of table 3(a) reports results for own-elasticities, whereas column (3) of table 3(a) reports results for cross-elasticities. The calculations show that for a 1% increase in the normalized number of lockouts within a state, the probability that a project will be located in that state decreases by approximately 0.0033%. The signs and magnitudes of the cross-elasticities are also as expected. For example, for a 1% increase in the normalized number of lockouts in other states, the probability that a project will be located in this state increases by approximately 0.0015%. Although these magnitudes are relatively small, the elasticities confirm that states that are perceived to have a pro-worker tilt will attract fewer projects.

Section 5.3.2: Economic Variables and Input Cost Results

In terms of the effects of other variables in table 3(a), the urban Gini coefficient (for per capita consumption expenditure) has a significant negative impact in column (1). A negative coefficient implies that firms prefer locating in areas with low inequality. This could be attributed to the fact that such areas may experience less labor unrest. Credit availability, as captured by the EXIM bank disbursement variable, is positive and significant. This implies that capital market considerations play an important role in a project's location decision. The average daily wage of unskilled laborers is seen to have a negative effect, whereas power tariffs have little effect on location choice. The workforce participation rate, state literacy measures, and the state's industrial growth rate are all measured imprecisely in table 3(a).

The road length variable (normalized by the area of the state) has a significant negative coefficient in table 3(a). This sign is unexpected as road length serves as a measure of state

infrastructure. Greater availability of surfaced roads lowers the cost of transportation, which should increase the probability that a project will be located in that area. However, states with better infrastructure may have higher real estate costs. Such costs may lower location choice probabilities (we have no information on real estate costs in areas where projects locate to test this explicitly).

The fixed effects of table 3(a) are also of interest. These variables capture state-specific unobservables which may influence location choice. From table 3(a) we observe that compared to Andhra Pradesh (base case), firm have a higher probability of locating in Kerala, Tamil Nadu, Uttar Pradesh, West Bengal and Delhi. Projects are relatively less likely to locate in Rajasthan and the 'Other' states category.

Section 5.4: Sensitivity to Formal Labor Regulation

The labor variables discussed as of now capture the on-the-ground impact of labor legislations. But formal labor laws and amendments may also be important determinants of location choice. We introduce these to test for the robustness of our labor conflict variables, and also to account for an alternative source of disincentives in choice of locations. As noted above, our information on specific categories of labor legislations is obtained from Besley and Burgess (2002).

We use the share of pro-worker amendments passed by a state, and dummies related to severance pay and the right to strike to capture the anti-employer stance of states (table 3(c)). Column (1) of this table shows that as hypothesized, the coefficient on the share of pro-worker amendments is negative and significant at the 1% level. In column (2), the severance pay dummy is negative and significant. This implies that states with provisions for severance pay

will attract fewer projects. This is because such provisions raise labor costs, and introduce inflexibilities in hiring and firing workers. The coefficient on the right to strike dummy insignificant. This may be due to collinearity between this dummy and the lockout variable – it is likely that states with a right to strike provision will have higher numbers of strikes and lockouts.

Other explanatory variables in both specifications have the same effects as before. In general, results suggest that with controls for input costs, economic conditions, and state unobservables, pro-worker states are less likely to attract new investment.

Section 5.5: Project Characteristics & Disaggregate Industry Results

Section 5.5.1: Influence of Project Characteristics

In table 4, we investigate the impact of project characteristics on location choice probabilities. We introduce two characteristics – a non-technology dummy and a project type dummy. The non-technology dummy takes a value of one if the project belongs to a "non-high-tech" industrial classification ("high-tech" industrial classifications include chemicals, electrical machinery, electronics-computers and software, non-electrical machinery and transport machinery). Thus in column (1) of table 4, all projects are classified as either non-high-tech or high-tech based on a non-technology dummy. We hypothesize that high-tech projects will be attracted to states that spend relatively more on research and development (R&D). In order to test this, we interact the non-technology dummy with a variable that measures state expenditures on R&D. If high-tech projects are more likely to locate in states that spend on R&D, we expect the interaction term to be insignificant. The first column of table 4 confirms that this is the case. Controlling for other variables that influence location choice, R&D expenditure has positive

effects on the location probabilities of high-tech projects only. As evident from the interaction term and *p*-value in column (1) of table 4, state-sponsored R & D expenditures have little effects on projects that are not technologically advanced.

Column (2) of table 4 studies the effects of a project type dummy. The "not new unit/new article" dummy takes the value zero if the project is classified as a new unit or new article. It takes the value one if the project is a renovation, rehabilitation, modernization or expansion. We hypothesize that firms are more likely to invest new projects in regions with relatively more growth. In order to test this, we interact the "not new unit/new article" dummy with a variable that measures the percent growth rate in industrial gross state product (GSP). If growing regions are more likely to attract new projects, we expect this interaction term to be insignificant. Estimates in column (2) confirm that this is the case; percent growth rate of industrial GSP has strong positive effects on location probabilities of new projects only. As evident from the interaction term and *p*-value in column (2) of table 4, the growth rate has little predictive power for projects that are not classified as new units or new articles.

Section 5.5.2: Analysis by Industrial Classification

An important consideration is the effect of resource constraints on project siting decisions. For example, projects related to mining or agriculture may not have a large degree of freedom in deciding choice of location, since such projects need to be situated close to sources of raw materials. Hence no matter how strong labor unrest is in a state, if that state happens to be a source of important raw materials and minerals, we would expect to see positive location choice probabilities for mining projects in that state (relative to the base case). To account for such considerations, location-specific constants are interacted with two industry dummies - these

dummies capture effects specific to (a) mining and agriculture and (b) manufacturing. Table 5 reports the results of this analysis.

From the first column of table 5 we observe that despite the negative effects of the labor conflict variables, the interaction of the mining and agriculture dummy with a state dummy is significant and positive in most cases. Consider the interaction term for Orissa. The positive coefficient implies that compared to Andhra Pradesh, mining and agricultural projects have a higher probability of locating in Orissa. This is as expected since Orissa has large mineral reserves. Alternatively, from the second column of table 5 we see that manufacturing projects have an especially high probability of locating in Punjab and Delhi (as compared to Andhra Pradesh). This is also as expected since these states lie in the "manufacturing belt" region of India.

As noted before, in both specifications of table 5, the labor conflict variable continues to exert a negative effect on location choice. Credit availability has a positive impact, whereas the Gini inequality measure has a negative impact (this is measured imprecisely in the second column of table 5).

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 between location choice and the labor conflict variables could arise. In order to determine whether such a bias is present, we formulate a 'big state' dummy[18]. 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 variable (normalized number of lockouts), and introduce this interaction term into the basic model of table 3(a). The model thus contains the normalized number of

[18] Big state dummy = 1 if state industrial GSP is greater than the median.

lockouts, the interaction of normalized number of lockouts with the 'big state' dummy, and the economic factors, input cost variables, and the state-fixed effects of the first column of table 3(a). If systematic differences in labor unrest by size of the state economy exist, then the interaction term should be significant. Upon estimating the model, we find that the interaction term is not significantly different from zero. Hence, our panel conditional logit results are unbiased.

Section 6: Conclusion

The results of this paper strongly support our hypothesis that labor conflict and pro-worker regulations have significant negative effects on new investments and location choice probabilities. As illustrated by a panel conditional logit model, a normalized measure of the number of lockouts, greater number of strikes and man-days lost due to labor disputes relative to other states, as well as a higher percentage of unionized workers, all act as disincentives on new investment. Additionally, amendments to the Industrial Disputes Act of 1947 (our measure of formal labor legislations) that favor workers over employers also hinder project siting.

Economic indicators such as a state-level urban Gini measure and credit availability have significant effects in most specifications. Firms prefer to locate in states with lower inequality and higher credit availability. Literacy, workforce participation, input costs, and infrastructure (road length) have little impacts on location choice, once labor conflict is controlled for. We disaggregate labor effects by project characteristics and industrial classifications. Our basic results remain robust to these alternative categorizations; labor unrest continues to exert strong negative effects on project location choice.

The results of this research have important policy implications. The strong negative effects of labor conflict and pro-labor rules suggest that states perceived as being more pro-

worker may suffer from a lack of industrial investment. This may generate negative repercussions on state output and productivity growth, as well as on employment generation within the region. Such negative effects may reduce welfare and lead to increased poverty and deprivation.

We recognize that these results are conditional in nature – the question that we consider is the particular location of a project, given that a project is going to exist. As noted above, there may be unconditional effects as well since restrictive laws could deter new projects. It is also possible that a firm which is planning to locate multiple projects will react differently to labor unrest as compared to a firm which is planning to locate a single project. Given data constraints, we are unable to address these issues here. We hope to do so in future work.

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APPENDIX
Table 1(a)
Summary Statistics (1998-1999)

State	Projects / Investment		Labor Conflict Variables						Formal Labor Regulation		
			Number of Lockouts (normalized by workforce)		Man-days - work stoppage		% of Unionized Workers		Sh. of pro-Wrk Amend. in Total Amend.	Right to Strike	Severance Pay Provision
	No.	Size	Mean	SD	Dummy		Mean	SD	Mean	Dummy	Dummy
		(Rs. Crore)			1998	1999					
Andhra Pra.	26	2410	0.0001	0.00004			0	0	0.5	1	1
Bihar	6	1100	0.00004	0.000001			0	0	0	0	0
Gujarat	46	2500	0.00002	0.00001			2.167	1.004	0.143	0	0
Haryana	12	733	0.00001	0.000004	1	1	1.206	0.239	0	0	0
Karnataka	44	2219	0.00002	0.000006			1.152	0.216	0.286	1	1
Kerala	7	28	0.0001	0.00003	1	1	1.733	0.103	0	0	0
Madhya Pra.	21	530	0.000004	0.0000001	0	0	0.910	0	0	0	1
Maharashtra	119	7178	0.00001	0.000005	0	0	0.877	1.177	0.571	0	1
Orissa	4	339	0.00002	0.00001	0	0	3.509	0.554	0.5	0	1
Punjab	16	3463	0.00002	0.000001	0	0	2.086	0.640	0	0	0
Rajasthan	18	6006	0.00004	0.00002	1	1	0.391	0.022	0.391	1	1
Tamil Nadu	60	8658	0.00005	0.00001			1.354	0.428	0	0	1
Uttar Pradesh	26	1180	0.00004	0.00001			0	0	1	0	0
West Bengal	16	1445	0.0003	0.0001	1	1	1.103	0	0.704	1	1
Other	5	226	0.00002	0.00001	0	0	3.994	1.256	0	0	0
Delhi	11	7985	0.0001	0.00003	0	0	10.303	1.365	0	0	0

State	Economic Variables						Input Cost Variables									
	EXIM Bank Disbursement		Urban Gini Coefficient		Industrial GSP - % Gwth Rate		Power Tariff of Medium Industry		Avg. Dly. Wage for Unskl. Wrk		Urban Workfrc. Parti.Rate		Literacy Program Enrol.		KM of Surfaced Road	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Andhra Pra.	0.617	0.043	0.313	0.004	4.193	3.834	417.9	31.11	46.65	5.869	33.18	1.870	169.5	0.896	0.049	0.00002
Bihar	0	0	0.316	0.003	17.98	27.35	140.5	0	38.5	3.535	25.15	1.042	64.20	3.430	0.017	0
Gujarat	0.250	1.004	0.287	0.008	3.940	0.655	367.2	62.98	48.13	6.541	35.88	0.070	96.91	1.032	0.050	0.003
Haryana	0.075	0.092	0.284	0.002	6.497	1.060	433.5	38.89	49.00	4.950	30.73	1.174	72.95	6.520	0.069	0.0003
Karnataka	0.212	0.117	0.320	0.002	8.057	1.905	374.6	45.36	60.38	14.32	34.78	0.426	121.0	4.566	0.038	0.0002
Kerala	0.028	0.011	0.325	0.007	5.896	0.013	241.7	33.04	75.63	6.541	33.58	1.996	55.98	0.376	0.173	0.015
Madhya Pr.	0.061	0.011	0.316	0.005	10.66	0.089	409.8	35.59	49.99	3.064	30.23	0.241	130	1.663	0.008	0.0001
Maharashtra	0.481	0.019	0.282	0.002	4.315	1.550	352.2	24.98	51.97	4.561	34.15	0.837	63.43	0.491	0.049	0.0001
Orissa	0	0	0.295	0.004	4.255	0.722	326.3	19.45	39.38	7.955	30.71	1.620	124.3	5.314	0.046	0.00003
Punjab	0.155	0.174	0.311	0.013	8.176	1.957	296	26.16	53.38	1.120	33.63	0.770	40.45	10.10	0.138	0.0005
Rajasthan	0.089	0.011	0.283	0.003	-1.45	23.39	390.5	38.42	39	1.414	29.42	1.386	149.1	0.615	0.012	0.0001
Tamil Nadu	0.177	0.135	0.341	0.009	-2.89	9.596	303.7	27.96	55.94	6.806	35.09	0.251	136.2	1.731	0.102	0.002
Uttar Pradesh	0.111	0.056	0.326	0.001	7.057	10.19	406.5	3.739	37.75	3.182	27.83	1.833	74.42	7.415	0.140	0.0003
West Bengal	0.066	0.051	0.330	0.003	7.321	0.590	408.1	25.45	37.75	0.353	32.61	0.020	147.1	1.451	0.162	0.007
Other	0	0	0.255	0.001	3.539	3.075	44.96	1.212	234.3	29.13	33.48	1.470	446.4	445.7	0.013	0.0002
Delhi	0.287	0.335	0.351	0.012	13.22	3.540	61.5	3.356	409.4	30.24	31.8	1.500	27	11.78	15.39	0.050

Note: The labor conflict variables are normalized by the workforce of the state. Credit availability is normalized by the industrial gross state product, literacy enrolment is normalized by state population and road length is normalized by the area of the state. The investment is the sum of Indian private investment in the state in 1998 and 1999. Conversion: 1crore =10,000000.

Table 1(a) continued
Summary statistics (1998-1999)

State	Projects				Labor conflict variables			
	Non-high-tech dummy		Not new unit/ new article dummy		Number of strikes (normalized)		Lockout dummy	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Andhra P.	0.0320	0.1763	0.0092	0.0953	0.2253	0.0469	1.0000	0.0000
Bihar	0.0137	0.1165	0.0046	0.0676	0.0973	0.0102	1.0000	0.0000
Gujarat	0.0595	0.2368	0.0366	0.1880	0.3853	0.0382	0.0000	0.0000
Haryana	0.0137	0.1165	0.0069	0.0827	0.4952	0.1161	0.0000	0.0000
Karnataka	0.0641	0.2452	0.0160	0.1257	0.1949	0.0656	0.0000	0.0000
Kerala	0.0137	0.1165	0.0000	0.0000	0.3218	0.0389	1.0000	0.0000
Madhya P.	0.0458	0.2092	0.0183	0.1342	0.0743	0.0245	0.0000	0.0000
Maharashtra	0.1693	0.3755	0.0664	0.2492	0.1080	0.0244	0.0000	0.0000
Orissa	0.0092	0.0953	0.0023	0.0478	0.2602	0.0300	0.5080	0.5005
Punjab	0.0229	0.1497	0.0092	0.0953	0.1709	0.0482	0.0000	0.0000
Rajasthan	0.0320	0.1763	0.0229	0.1497	0.2250	0.0068	0.4920	0.5005
Tamil Nadu	0.0961	0.2951	0.0366	0.1880	0.6350	0.0854	1.0000	0.0000
Uttar P.	0.0343	0.1823	0.0229	0.1497	0.0631	0.0237	1.0000	0.0000
West Bengal	0.0229	0.1497	0.0069	0.0827	0.1566	0.0144	1.0000	0.0000
Other	0.0069	0.0827	0.0000	0.0000	0.7359	0.1421	0.0000	0.0000
Delhi	0.0000	0.0000	0.0023	0.0478	0.0206	0.0078	1.0000	0.0000

Economic variables

State	ICICI disbursement (normalized)		Planned outlay on manufacturing		Planned outlay on mining		R&D exp. by state (normalized)		% growth rate of GSP (3 yr. moving average)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Andhra P.	51.1160	16.4253	26.7232	4.3232	0.6397	0.2612	45.2523	1.6862	5.0590	0.7273
Bihar	35.2197	2.0941	26.9427	8.8494	2.0794	0.1045	34.3248	0.8096	11.0989	0.9895
Gujarat	119.6367	8.3174	75.4930	25.2430	1.4716	0.9549	55.9034	3.3589	5.8711	1.9338
Haryana	80.6230	12.9545	51.4696	39.3823	0.1315	0.0046	87.1136	0.8812	7.2253	0.2494
Karnataka	87.8972	26.1434	90.4649	9.9151	0.5382	0.1550	34.9899	0.2470	11.9815	1.4176
Kerala	19.9982	3.1470	296.9515	1.4331	2.3372	0.4789	94.8682	2.8442	4.6520	0.3442
Madhya P.	15.5735	6.1331	51.6648	28.7766	2.5090	0.7133	20.9599	0.5847	11.5756	0.7282
Maharashtra	322.4754	18.7282	57.1330	3.6559	0.7935	0.6074	66.6377	3.0570	4.8371	0.3558
Orissa	74.6549	8.4408	56.9761	1.0439	6.2687	0.2964	53.9155	5.5317	2.6264	0.6157
Punjab	24.4484	2.8283	57.5927	0.3784	0.5228	0.5151	71.8474	2.3563	6.8704	0.3153
Rajasthan	19.9936	3.9848	101.7078	33.5257	46.2467	13.1108	16.0558	1.9118	4.4462	4.6529
Tamil Nadu	67.4197	12.6739	67.0833	9.1090	0.1037	0.0025	34.0378	4.4019	2.2250	3.1844
Uttar P.	24.9786	7.6362	30.8964	6.8915	0.5455	0.1231	36.4160	0.6022	7.8335	1.7228
West Bengal	90.7353	4.3265	183.9608	20.8983	1.9665	0.1173	14.6266	0.2001	6.9842	0.4981
Other	13.6871	2.6060	231.6575	2.0031	11.1853	0.0614	64.0508	1.1575	4.6925	0.7150
Delhi	327.7189	173.3535	21.9467	10.3955	0.0000	0.0000	0.0000	0.0000	5.5178	4.1331

Table 1(a) continued
Summary statistics (1998-1999)

State	Input cost variables											
	Wage unskilled male		Wage unskilled female		Avg. power tariff		Power tariff for large industries		Urban workforce part. rate male		KMs of all roads	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Andhra P.	51.138	5.555	42.294	2.752	420.330	19.008	422.428	15.993	51.911	0.825	0.062	0.000
Bihar	39.524	1.501	37.556	3.503	195.028	6.227	249.516	12.455	42.655	0.412	0.029	0.000
Gujarat	51.580	5.005	44.818	4.254	384.363	42.022	400.821	39.463	59.369	0.570	0.065	0.002
Haryana	53.572	4.504	44.540	2.502	427.531	25.400	421.122	23.273	50.105	0.595	0.090	0.000
Karnataka	65.422	10.760	55.652	9.509	404.822	22.205	434.554	12.305	54.132	0.022	0.046	0.000
Kerala	79.318	4.254	72.080	5.005	243.950	22.121	245.801	20.853	52.039	1.281	0.243	0.018
Madhya P.	56.693	1.668	43.376	2.669	422.295	19.939	434.350	14.689	47.624	0.173	0.012	0.000
Maharashtra	55.909	3.703	48.127	2.752	351.598	16.013	350.744	14.347	53.042	0.733	0.066	0.000
Orissa	42.620	7.507	36.310	3.753	334.173	8.094	341.876	2.425	49.771	0.407	0.089	0.000
Punjab	60.770	1.251	46.005	0.333	314.427	18.894	332.558	19.269	55.544	1.296	0.192	0.000
Rajasthan	41.516	1.001	36.516	1.001	404.600	28.245	418.271	29.297	47.974	0.340	0.018	0.000
Tamil Nadu	60.965	5.630	51.064	4.004	307.392	18.474	310.774	17.157	54.617	0.093	0.113	0.001
Uttar P.	38.703	2.335	36.868	2.168	418.597	1.624	430.637	0.603	46.790	0.468	0.172	0.000
West Bengal	40.000	0.000	35.492	0.500	389.369	15.149	370.314	12.281	54.298	0.232	0.244	0.008
Other	46.873	1.001	43.082	0.715	237.821	22.770	241.060	24.922	49.749	0.115	0.018	0.000
Delhi	61.540	2.502	61.540	2.502	425.184	20.056	440.656	18.711	52.744	0.350	17.084	0.035

Table 1(b)
Variables With Years of Availability And Source

Variables	Source
Labor Conflict and Regulation Variables	
Number of Lockouts, Strikes (1997-1999)	Rajya Sabha Starred Question No. 196, dated 08.03.2001
Mandays Lost Due to Work Stoppage (1997-2000)	Pocket Book of Labour Statistics 1998, Labour Bureau, Ministry of Labour, Govt. of India
Percentage of Unionized Workers (1996-1997)	Statistical Abstract, 2000, Central Statistical Organization
Formal Labor Regulation (1994-2000)	Besley & Burgess (2002).
Economic Variables	
EXIM Bank Disbursement (1994-2000)	Report on Development Banking in India 2000-01, Industrial Development Bank of India
ICICI Bank Disbursement (1995-2000)	Rajya Sabha Unstarred Question No.1794, dated 8.8.2000
Urban Gini Coefficient (1998-2000)	National Human Development Report 2001, Planning Commission, Govt. of India.
Industrial GSP - Level & Growth Rate (1994-2000)	Central Statistical Organization
Input Cost Variables	
Power Tariffs (1998, 2000)	Rajya Sabha Unstarred Question No. 845, dated 24.07.2002.
Average Daily Wage for Unskilled Male and Female Workers (1995-2000)	Building Material Prices and Wages of Labour, Ministry of Urban Development & Poverty Alleviation, Govt. of India.
Urban Workforce Participation Rate (1998-2000)	India Yearbook 2002, Manpower Profile.
Literacy Program Enrollment (1998-1999)	Annual Report 1998-99, Literacy Campaigns in India, National Literacy Mission, Directorate of Adult Education, Ministry of Human Resource Development.
Kilometers of Surfaced Roads (1994-1999)	Basic Road Transport Statistics of India, Ministry of Transport and Highways, Govt. of India
Normalization Variables	
Population in Thousands (1996-2000)	Population Projections for India and States 1996-2016, Registrar General, Ministry of Home Affairs, Govt. of India.
Total Workforce (1996-2000)	2001 Census, Govt. of India
Area in Square Kilometers (1996-2000)	1991 Census, Govt. of India

Table 1(c)
State/Union Territory Classifications

State/Union Territory	#	State/Union Territory	#		#
Andhra Pradesh	1	Kerala	6	Rajasthan	11
Bihar, Jharkhand	2	Madhya Pradesh, Chattisgarh	7	Tamil Nadu, Pondicherry	12
Gujarat, Dadar & Nagar Haveli	3	Maharashtra, Goa, Daman & Diu	8	Uttar Pradesh, Uttaranchal	13
Haryana	4	Orissa	9	West Bengal	14
Karnataka	5	Punjab, Chandigarh	10	Delhi	16
Arunachal Pradesh, Assam, HP, Jammu & Kashmir, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura					15

Table 1(d)
Industrial Classification

Classification	Industry Sub-Categories
Manufacturing	Base Metals, Chemicals, Electric Machinery, Electronics, Fats and Oils, Leather, Misc. Manufacturing, Non-electrical Machinery, Plastics, Pulp and Paper, Textiles, Transport Machinery, Wood
Mining and Quarrying	Minerals, Non-metal Minerals
Agriculture, Forestry and Fishing	Agriculture, Animals, Foods
Electricity, Gas and Water	Electricity

Table 1(e)
Project Characteristics By Location (1997-1999)

State	Number of Projects	Size (Rs. Crore)
Andhra Pradesh	43	6187
Bihar	9	2865
Gujarat	74	6391
Haryana	24	2146
Karnataka	68	3113
Kerala	10	128
Madhya Pradesh	27	1565
Maharashtra	165	11963
Orissa	10	10098
Punjab	21	3965
Rajasthan	25	6276
Tamil Nadu	85	12017
Uttar Pradesh	32	1260
West Bengal	22	2216
Other	9	573
Delhi	13	9697
Total	637	80460

Table 1(f)
Project Characteristics By Sector (1997-1999)

Characteristics	Agriculture	Mining	Manufacturing	Electricity, Gas & Water
Number of Projects	58	61	409	109
Average Investment (in Rs. Crore)	56.87	176.52	96.23	404.26
Project Type:				
(i) New Unit/Article	41	37	290	104
(ii) Renovation/ Modernization, Rehabilitation, Substantial Expansion	17	24	119	5

Table 2

State-wise Determinants of Number of Projects and Investment

Variable	(1) No. of projects In state	(2) No. of projects In state	(3) Total investment in state	(4) Total investment in state
Number of lockouts (norm. by industrial GSP)	-12.8898** (4.5994)	-10.5252** (2.8570)	-633.1823* (309.6274)	-706.9533** (204.1828)
Number of strikes (norm. by industrial GSP)	0.2361 (0.2631)		-1.3396 (24.3518)	
ICICI bank disbursement (norm. by industrial GSP)	0.0008 (0.0008)		-0.0927 (0.0675)	
EXIM bank disbursement (norm. by industrial GSP)	-0.0218 (0.3069)		1.7105 (28.4658)	
Planned outlay for manufac. (norm. by industrial GSP)	0.0029* (0.0012)	0.0025* (0.0010)	0.1537 (0.1013)	0.1649# (0.0980)
Percent growth rate of industrial GSP	0.0296# (0.0157)	0.0331* (0.0144)	-1.064 (1.0381)	-1.569 (0.9749)
Daily wage for unskilled male workers	-0.0300# (0.0160)	-0.0336* (0.0153)	-1.9258 (1.3121)	-1.6805 (1.2145)
Daily wage for unskilled female workers	0.0637** (0.0178)	0.0698** (0.0170)	1.7944 (1.4481)	1.2719 (1.3269)
R&D expenditure by state (norm. by industrial GSP)	-0.0313 (0.0191)		-0.9693 (1.7243)	
Constant	1.9246** (0.3616)	1.8767** (0.3042)	75.1888** (26.0000)	82.6952** (21.7760)
Observations Log Likelihood R-squared	96 -260.4598	96 -261.8175	96 0.536	96 0.518

Standard errors in parenthesis. Data from 1994-1999. Columns (1) and (2) estimate fixed effects negative binomial models with robust standard errors. Columns (3) and (4) estimate linear fixed effects models. The state-fixed effects estimates of columns (1) – (4) are not reported. # significant at 10%; * significant at 5%; ** significant at 1%.

Table 3(a) - Basic Conditional Logit Model (Dependent Variable: Location Choice)

Variable	(1)	(2)	(3)
Number of lockouts (norm. by workforce)	-7,465.2994**	-0.0033	0.0015
	(2,878.5014)		
Normalized EXIM bank disbursement	4.6459**	0.0094	-0.0025
(normalized by industrial GSP)	(1.6126)		
Urban Gini coefficient (lagged 1 year)	-63.4004**	-0.0656	0.0674
	(16.2020)		
Percent growth rate of industrial GSP	0.005	0.0001	-0.0001
	(0.0139)		
Average daily wage for unskilled labor	-0.0498#	-0.0078	0.0086
(lagged 3 years)	(0.0278)		
Power tariff for medium industries	0.0007	0.001	-0.0009
(lagged 1 year)	(0.0065)		
Average urban workforce participation rate	0.0217	0.0024	-0.0024
(lagged 1 year)	(0.0578)		
Kilometers of surfaced roads	-35.4334**	-0.0057	0.1301
(normalized by area of state) (lagged 1 year)	(13.5059)		
Enrolment in literacy program	-0.0001	-0.0001	0.00004
(per thousand of population)	(0.0003)		
Bihar dummy	-0.3777		
	(2.4118)		
Gujarat dummy	-0.1122		
	(1.5393)		
Haryana dummy	-0.2667		
	(1.4717)		
Karnataka dummy	2.2576		
	(1.6639)		
Kerala dummy	7.8501*		
	(3.8228)		
Madhya Pradesh dummy	0.266		
	(1.3278)		
Maharashtra dummy	-0.428		
	(1.5254)		
Orissa dummy	-1.3191		
	(1.6077)		
Punjab dummy	4.1886		
	(2.6109)		
Rajasthan dummy	-2.1133*		
	(1.0635)		
Tamil Nadu dummy	6.4207*		
	(2.6667)		
Uttar Pradesh dummy	5.3791*		
	(2.4043)		
West Bengal dummy	7.8578*		
	(3.2461)		
Other dummy	-4.5454*		
	(2.1827)		
Delhi dummy	547.0377**		
	(208.5479)		

No of obs. = 6992. Sample consists of 437 projects over 2 years (1998-1999). Standard errors (adjusted for clustering at the state level) in parenthesis. # significant at 10%; * significant at 5%; ** significant at 1%. The average daily wage of unskilled labor is for men and women combined. The average urban workforce participation rate is for men and women combined.

Table 3(b)
Sensitivity Analysis

Variable	(1)	(2)	(3)
Lockout dummy	-1.2792**		
	(0.4807)		
Mandays lost due to work stoppage dummy		-0.5071*	
		(0.2195)	
Percentage of unionized workers			-1.0313**
			(0.0222)
Normalized EXIM bank disbursement	2.7144	3.3151*	7.2697**
	(1.6989)	(1.4960)	(0.1235)
Urban Gini coefficient (lagged 1 year)	-49.7398**	-32.1549	-93.1800**
	(14.9321)	(22.1723)	(0.8862)
Percent growth rate of industrial GSP	0.0082	-0.0006	
	(0.0140)	(0.0128)	
Percent growth rate of industrial GSP			0.0669**
- 3 year moving average			(0.0052)
Average daily wage for unskilled labor	-0.0048	-0.018	-0.0884**
(lagged 3 years)	(0.0330)	(0.0262)	(0.0021)
Power tariff for medium industries	-0.0028	0.0088	
(lagged 1 year)	(0.0055)	(0.0078)	
Average urban workforce participation rate	0.0107	-0.148	
(lagged 1 year)	(0.0381)	(0.0983)	
Kilometers of surfaced roads	-24.2253	-64.6344*	
(normalized by area of state) (lagged 1 year)	(15.0010)	(25.9737)	
Enrolment in literacy program	0.0005	0.0004	0.0026**
(per thousand of population)	(0.0004)	(0.0004)	(0.00001)
Average power tariff for industries			0.0567**
(lagged 1 year)			(0.0020)
Urban male workforce participation rate			-0.5118**
(lagged 1 year)			(0.0135)
Kilometers of all roads			-50.6331**
(normalized by area of state) (lagged 1 year)			(1.0566)
Observations	6992	6717	4374

Standard errors (adjusted for clustering at the state level) in parenthesis. Models include state-fixed effects; these are not reported. Sample consists of 437 projects over 2 years (1998 & 1999). # significant at 10%; * significant at 5%; ** significant at 1%. The average daily wage for unskilled labor is for men and women combined. The average urban workforce participation rate is for men and women combined. The average power tariff is for small, medium, and large industries combined.

Table 3(c) - Formal Labor Regulations (Dependent Variable: Location Choice)

Variable	(1)	(2)
Number of lockouts	-7,465.2994**	-7,465.2994**
(normalized by workforce)	(2,878.5014)	(2,878.5014)
Share of pro-worker amendments	-1,094.0754**	
in total number of amendments	(417.0956)	
Severance pay dummy		-546.7717**
		(208.3610)
Right to strike dummy		-0.266
		(1.3278)
Normalized EXIM bank disbursement	4.6459**	4.6459**
	(1.6126)	(1.6126)
Urban Gini coefficient (lagged 1 year)	-63.4004**	-63.4004**
	(16.2020)	(16.2020)
Average daily wage for unskilled	-0.0498#	-0.0498#
labor (lagged 3 years)	(0.0278)	(0.0278)
Power tariff for medium	0.0007	0.0007
industries (lagged 1 year)	(0.0065)	(0.0065)
Average urban workforce	0.0217	0.0217
participation rate (lagged 1 year)	(0.0578)	(0.0578)
Percent growth rate of industrial GSP	0.005	0.005
	(0.0139)	(0.0139)
Kilometers of surfaced roads	-35.4334**	-35.4334**
(normalized by area of state) (lagged 1 year)	(13.5059)	(13.5059)
Enrolment in literacy program	-0.0001	-0.0001
(per thousand of population)	(0.0003)	(0.0003)
Bihar dummy	-547.4154**	-547.4154**
	(207.3302)	(207.3301)
Gujarat dummy	-390.8534**	-547.1498**
	(148.3923)	(207.9756)
Haryana dummy	-547.3044**	-547.3044**
	(208.2754)	(208.2755)
Karnataka dummy	-232.1871**	2.2576
	(88.3836)	(1.6639)
Kerala dummy	-539.1876**	-539.1876**
	(205.3748)	(205.3748)
Madhya Pradesh dummy	-546.7717**	
	(208.3609)	
Maharashtra dummy	77.7203**	-0.694
	(29.6843)	(1.6250)
Orissa dummy	-1.3191	-1.5851
	(1.6077)	(1.6582)
Punjab dummy	-542.8491**	-542.8491**
	(206.3872)	(206.3872)
Rajasthan dummy	-199.0469**	-2.1133*
	(74.7718)	(1.0635)
Tamil Nadu dummy	-540.6170**	6.1547*
	(206.3966)	(2.5749)
Uttar Pradesh dummy	552.4168**	-541.6586**
	(210.5347)	(206.5700)
West Bengal dummy	230.7250**	7.8578*
	(87.6542)	(3.2461)
Other dummy	-551.5831**	-551.5831**
	(208.5377)	(208.5378)

No. of obs. = 6992. Sample consists of 437 projects over 2 years (1998 & 1999). Standard errors (adjusted for clustering at the state level) in parenthesis. # significant at 10%; * significant at 5%; ** significant at 1%.

Table 4 - Influence of Project Characteristics
Dependent Variable: Location Choice

Variable	(1)	(2)
Number of lockouts	-3,603.0913#	-3,590.7339#
(normalized by workforce)	(1,930.8483)	(1,942.4139)
Normalized EXIM bank disbursement	3.5548**	3.4923**
	(1.2269)	(1.2460)
Urban Gini coefficient	-55.9001**	-55.6190**
(lagged 1 year)	(15.2161)	(15.1991)
Average daily wage for unskilled	-0.0185	-0.0181
labor (lagged 3 years)	(0.0163)	(0.0164)
Power tariff for large industries	-0.0023	-0.0024
(lagged 1 year)	(0.0048)	(0.0048)
Kilometers of all roads (normalized	-23.9776*	-23.5606#
by area of state) (lagged 1 year)	(11.9580)	(12.0519)
Planned outlay by state on mining	-0.0717**	-0.0703**
industries (normalized by industrial GSP)	(0.0111)	(0.0112)
R&D expenditure by state	0.0400#	0.0389#
(normalized by industrial GSP)	(0.0238)	(0.0237)
Percent growth rate of industrial GSP	0.0242**	0.0298**
	(0.0087)	(0.0095)
Normalized R&D expenditures *	-0.0001	
dummy for non-high-tech project	(0.0095)	
Percent growth rate of industrial GSP*		-0.0245
dummy for not new unit/new article		(0.0228)
Sum of coefficients of norm. R&D expenditure and interaction of norm. R&D expenditure with dummy for non-high-tech project	0.0399	
Sum of coefficients of percent growth rate of industrial GSP and interaction of percent growth rate of industrial GSP with dummy for not new unit/new article		0.0053
p-value that sum of coefficients = 0	0.1044	0.7928
Observations	6992	6992

Standard errors (adjusted for clustering at the state level) in parenthesis. Models include state-fixed effects; these are not reported. Sample consists of 437 projects over 2 years (1998 & 1999). # significant at 10%; * significant at 5%; ** significant at 1%. The average daily wage for unskilled labor is for men and women combined.

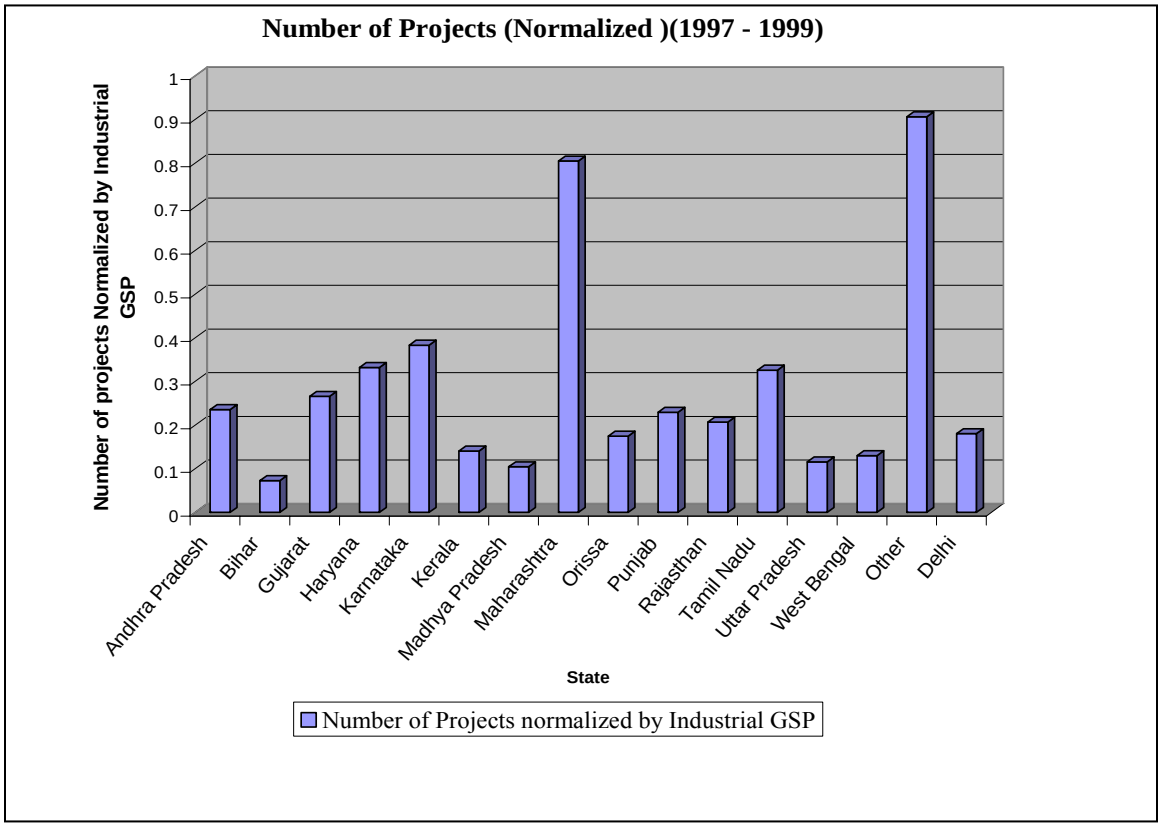
Table 5: Analysis by Industrial Classification

Variable	Mining & Agriculture	Manufacturing
Number of lockouts	-7,730.1276**	-6,127.6991#
(normalized by workforce)	(2,883.1202)	(3,420.0389)
Normalized EXIM bank disbursement	4.5800**	3.6490*
	(1.5810)	(1.4185)
Urban Gini coefficient	-63.2250**	-17.0214
(lagged 1 year)	(17.1814)	(13.4101)
Average daily wage for unskilled	-0.0503#	-0.0784**
labor (lagged 3 years)	(0.0275)	(0.0251)
Power tariff for medium	0.0008	0.0153**
industries (lagged 1 year)	(0.0067)	(0.0046)
Average urban workforce	0.0277	-0.0717#
participation rate (lagged 1 year)	(0.0586)	(0.0416)
Percent growth rate of industrial GSP	0.0049	0.0125
	(0.0137)	(0.0104)
Kilometers of surfaced roads (normalized	-34.1564**	-19.845
by area of state) (lagged 1 year)	(12.8832)	(12.7334)
Enrolment in literacy program	-0.0001	-0.0001
(per thousand of population)	(0.0003)	(0.0005)
Industry dummy * Bihar dummy	0.1320*	-0.6232**
	(0.0550)	(0.0946)
Industry dummy * Gujarat dummy	0.1567**	0.6197**
	(0.0174)	(0.0896)
Industry dummy * Haryana dummy	-14.9884**	0.1189
	(1.0474)	(0.0899)
Industry dummy * Karnataka dummy	0.6270**	-0.5793**
	(0.0253)	(0.0931)
Industry dummy * Kerala dummy	1.4572**	-0.8724**
	(0.0525)	(0.0876)
Industry dummy * Madhya Pradesh dummy	-0.1035**	-0.6194**
	(0.0250)	(0.0871)
Industry dummy * Maharashtra dummy	0.1895**	0.4237**
	(0.0305)	(0.0884)
Industry dummy * Orissa dummy	2.8203**	-1.6877**
	(0.0227)	(0.0838)
Industry dummy * Punjab dummy	-15.4647**	1.3714**
	(1.0375)	(0.0783)
Industry dummy * Rajasthan dummy	0.9940**	-0.7399**
	(0.0254)	(0.0884)
Industry dummy * Tamil Nadu dummy	0.3391**	-0.4902**
	(0.0218)	(0.0894)
Industry dummy * Uttar Pradesh dummy	0.9208**	-0.1068
	(0.0326)	(0.0814)
Industry dummy * West Bengal dummy	0.9490**	0.2194*
	(0.0405)	(0.0967)
Industry dummy * Other dummy	-14.2947**	1.3889
	(1.0310)	(1.1397)
Industry dummy * Delhi dummy	-15.0652**	18.6274**
	(1.0328)	(3.2620)
Observations	6992	6992

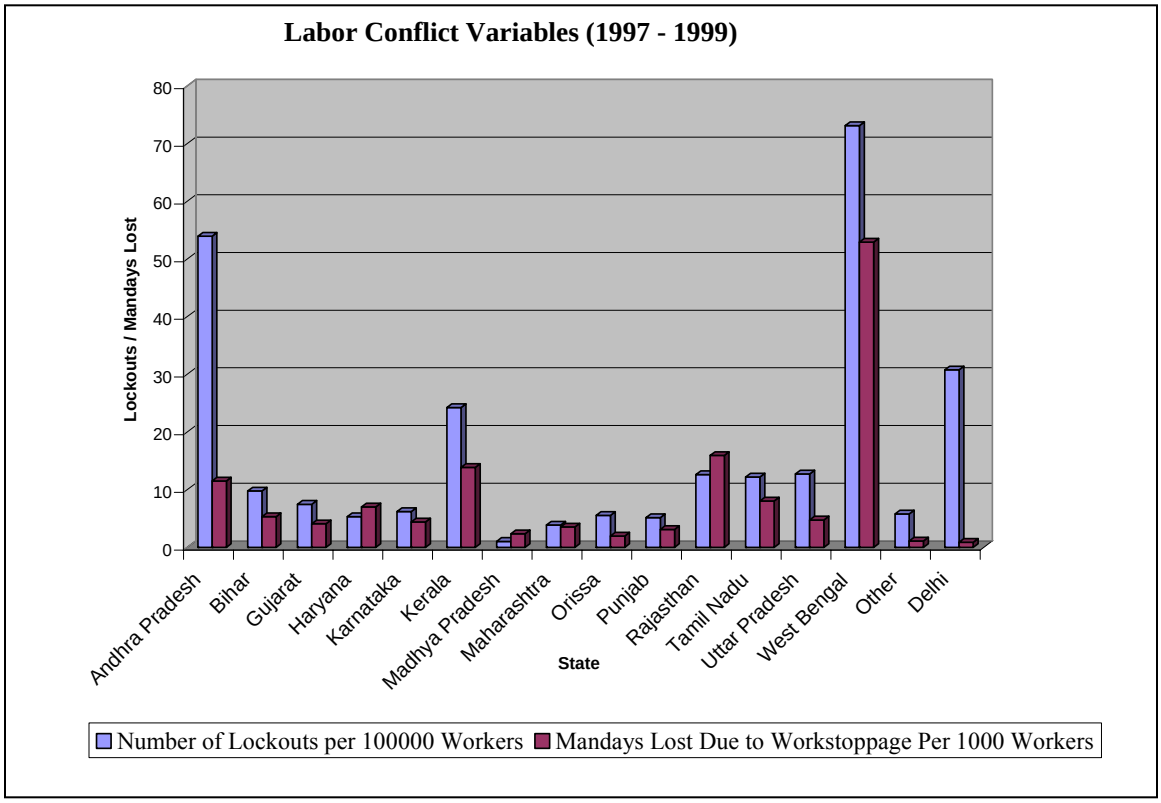
Standard errors (adjusted for clustering at the state level) in parenthesis. Models include state-fixed effects; these are not reported. Sample consists of 437 projects over 2 years (1998 & 1999). # significant at 10%; * significant at 5%; ** significant at 1%. The average daily wage for unskilled labor is for men and women combined. The average urban workforce participation rate is for men and women combined.

GRAPHS

Graph 1



Graph 2


Labor Conflict Variables (1997 - 1999)
Lockouts / Mandays Lost
80
70
60
50
40
30
20
10
0
Andhra Pradesh
Bihar
Gujarat
Haryana
Karnataka
Kerala
Madhya Pradesh
Maharashtra
Orissa
Punjab
Rajasthan
Tamil Nadu
Uttar Pradesh
West Bengal
Other
Delhi
State
Number of Lockouts per 100000 Workers
Mandays Lost Due to Workstoppage Per 1000 Workers