Friend or Foe or Family?

A Tale of Formal and Informal Plants in India

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Abstract

This paper examines the interaction between formal (organized) and informal (unorganized) plants in the manufacturing sector in India. How has the size and productivity of the plants in the organized sector affected the plants in the unorganized sector? How have informal plants affected formal plants? Are the magnitudes of the effects symmetric in either direction? The evidence shows that there are positive horizontal and vertical spillovers in each direction. Informal firms are an important supplier of inputs to formal firms. Employment and output in the organized sector is greater in those states in India

that have a greater presence of unorganized suppliers of inputs. Conversely, unorganized employment and output are greater in states that have a greater presence of organized buyers of inputs. But there are two important asymmetries in the relationship between the organized and unorganized sectors. First, the unorganized sector is much more dependent on and responsive to organized sector presence than vice versa. Second, unorganized sector productivity is dependent on and responsive to organized sector productivity and presence but the reverse is not true.

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Friend or foe or family? A tale of formal and informal plants in India¹

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Section I. Introduction

Nearly 20 years after enacting major market-oriented reforms, India faces new opportunities and challenges in sustaining high growth, promoting shared prosperity, and eliminating extreme poverty. India has the potential to sustain high growth thanks to demographic dividend. But the slow pace of job creation can transform the demographic dividend into demographic disaster ([Bloom (2011)]). A majority of jobs in the manufacturing sector is created in the unorganized/informal⁵ segment of the economy ([Government of India (2012)], [Ghani et al. (2011a)]). The most prevalent view of the informal sector is that it is stagnant and produces “bad” jobs (i.e. highly insecure, low wage jobs).

But what is not well known is the interaction between formal and informal sectors. Do firms in organized sector outsource their work to informal sectors to remain cost competitive? What are the product market, input market and other linkages between the organized and unorganized segments? The answer to these questions is important because on the one hand labor-intensive tasks being outsourced from organized sector can cause intense cost competition and a downward spiral of wages in the unorganized sector ([Meagher (1995)]). On the other hand, product market, input market and fiscal linkages between the organized and unorganized segments can bolster employment and productivity in each individual segment. Additionally entry into the unorganized sector may be voluntary ([Maloney (2004)]). The exact nature and magnitude of linkages and spillovers between the organized and unorganized sector has huge policy implications for whether policies should focus on the organized/formal or unorganized/informal sectors.

Another important concern for policy makers is the fact that the manufacturing sector in India has been accused of producing “jobless growth”. Large scale manufacturing in India tends to be relatively skill- and capital-intensive ([Chamarbagwalla and Sharma (2011)]) and most employment generation occurs in small (organized and unorganized) ancillary plants that are

⁵ In this paper we will use the word unorganized interchangeably with informal. Our definition is based on the definition used by the National Sample Survey organization that includes in the unorganized sector all economic units that have less than 10 employees (and using power) or those that have less than 20 employees (and don't use power) and which are not required to register with the government.

vertically linked with large scale factories. Even in highly industrialized states like Gujarat that have attracted and retained large scale manufacturing employment growth has been disappointing as ancillary plants have not followed.

The questions we answer in this paper are directly motivated by these issues and challenges. We ask whether the two sectors nurture or cannibalize each other in terms of employment, output and productivity. In particular we ask whether the size and productivity of the unorganized sector increase the size and productivity of the organized sector plants. Further, does the size and productivity of the *organized* sector increase the size and productivity of the *unorganized* sector plants? Are the magnitudes of the effects symmetric in either direction?

We find that there exist substantial positive horizontal linkages between organized and unorganized sectors. The two sectors are friends within the same industry. We also find substantial positive spillovers due to input-output linkages from the unorganized to the organized sector and vice versa. Thus the two sectors act like family by supporting each other (the unorganized sector as a major supplier to the organized sector and the organized sector as a major buyer from the unorganized sector).

When we examine the nature of productivity spillovers we find that a larger, more productive organized sector boosts employment, output and productivity in the unorganized sector. Surprisingly and critically there do not exist horizontal and vertical productivity spillovers from the unorganized sector to the organized sector.

When we compare the spillovers from the unorganized to the organized sector and vice versa – which we refer to as “other-sector spillovers” -- to spillovers within each sector – “own-sector spillovers” -- we find that both organized and unorganized sector plants seem to locate in states which contain more *own-sector* buyers of their products. In contrast organized sector plants tend to locate in states with more *other-sector* suppliers of inputs. Unorganized plants tend to locate in states with more *other-sector* buyers of their products.

The unorganized sector is much more dependent on the organized sector as a source of demand than the organized sector depends on the unorganized sector as a source of supply. The bi-directional nature of our analysis allows us to identify this asymmetry and to infer that greater

organized sector economic activity is more likely to increase unorganized sector activity than vice versa.

This paper makes the following contribution.

- Unlike other papers which conflate manufacturing and service inputs when they model the relationship between the organized and unorganized sectors we explicitly focus on the flow of *manufactured* inputs between the organized and unorganized sectors. The positive sign and large size of the spillover coefficient is novel given that we are focusing only on manufactured inputs.
- Second, we differentiate between horizontal and vertical linkages between the organized and unorganized sectors (“other-sector spillovers”) using input-output tables. We examine vertical linkages within the organized and unorganized sectors (“own-sector spillovers”) and use these to put into context the magnitude of other-sector spillovers. Our measures of forward and backward input-output linkages are simple and intuitive adaptations from trade and FDI literature.
- Third, we examine the bi-directional nature of the relationship between the organized and unorganized sectors. If the organized sector is a large *buyer* of inputs from the unorganized sector then the unorganized sector must be a large *seller* of inputs to the organized sector. While our coefficients do not have a causal interpretation by establishing the significance and magnitude of the vertical relationship in each direction we try to understand the direction of causality. In particular we find that greater presence of organized buyers increases unorganized sector presence much more than a larger presence of unorganized suppliers increases organized sector presence. That is the unorganized sector is more dependent on the organized sector (as a buyer of inputs) than vice versa.
- Fourth, we examine the productivity of the unorganized and organized sectors as a function of other-sector and own-sector spillovers. Case studies ([Meagher (1995)]), anecdotal evidence and theoretical models ([Lewis (1954)], [Todaro (1969)], [Ranis and Stewart (1999)]) posit different effects of vertical linkages on unorganized sector wages and productivity. The effect on organized sector productivity is simply assumed to be positive given that the organized sector continues to buy from the unorganized sector.

There is very little rigorous empirical evidence that productivity spillovers even exist between the organized and unorganized sector. Our analysis focuses on both organized and unorganized sector productivity and fills in this hole in the literature.

- Lastly we make innovative use of many years of organized sector data to ask whether growth in organized manufacturing is jobless growth.

The paper is organized as follows. In Section II we survey the literature. Section III and Section IV describe the data and empirical methods used in this paper. Section V provides estimates on organized sector employment and output and Section VI provides results on unorganized sector employment and output. Section VII focuses on total factor productivity of the organized and unorganized sectors. In Section VIII we examine the extent the lagged spillovers between the two sectors and provide evidence of jobless growth. In Appendix I we extend the main results by examining several industry and plant-level sources of heterogeneity – industrial policy reforms, unorganized plant location as well as organized plant size – that may affect the size of spillovers between the organized and unorganized sectors.

Section II. Literature Survey

Until recently the theoretical modeling of the informal/unorganized sector in an economy was constrained to the dual economy framework of [Lewis (1954)] and [Todaro (1969)] where the unorganized sector is treated as completely separate from the rest of the economy. The unorganized sector absorbs excess labor not absorbed by the organized sector. Hence the labor market is the only link between the organized and unorganized sectors. Further these models assumed segmentation in the labor market which leads to different wages in organized and unorganized sectors. These models imply that as the size of the organized sector expands (increasing rural to urban migration) the size of the unorganized sector expands. However unorganized sector wages fall as the same amount of earnings are split between the ever-increasing unorganized work force. Further this literature also assumes strict dualism in product markets. Organized and unorganized sectors produce similar products but serve different markets and charge different prices. The unorganized sector mainly services low income consumers charging low prices and hence is stuck with low productivity.

Recent literature (for e.g., [Ranis and Stewart (1999)]) has modeled more nuanced and realistic relations between the organized and unorganized sectors. The two sectors can be linked with each other via final product market linkages (for e.g., unorganized sector sells to consumers that work in the organized sector and vice versa); input market linkages; as well as via fiscal linkages. In most cases the unorganized sector is defined as not being regulated or taxed by the government implying little or no fiscal linkages. But the existence of product market and input-output linkages between the organized and unorganized sector has important policy implications. If the sectors are vertically linked then the existence of the unorganized sector may not necessarily be a bad thing. Policies may then need to focus on increasing the productivity of the unorganized sector rather than on formalization of economic activity.

Recent literature has also stressed the immense heterogeneity of plants that comprise the unorganized sector (for e.g., modern versus traditional segments ([Ranis and Stewart (1999)], [Moreno-Monroy et al. (2012)]); capital-intensive versus labor-intensive segments ([Marjit (2003)]); upper-tier versus lower-tier segments ([Maloney (2004)]). There is also increased recognition that firms choose informality for a variety of reasons ([Maloney (2004)], [Lachaud (1990)]). Thus different sub-groups of the unorganized sector may be linked differently to the organized sector. Further [Ghani et al. (2011a)] show that different segments of the *organized* sector may be linked differently to the unorganized sector.

The relationship between the organized and unorganized sectors been examined in many developing countries. For example, [Xaba and Motala (2002)] focus on a sub-sample of 13 Sub-Saharan countries and find substantial linkages between *households* employed in the organized and unorganized sectors in final product markets. That is each sector is a strong supply and demand base for the other sector. [Boehme and Thiele (2011)] report similar results for six West African capitals.

For linkages in intermediate product markets (where organized (unorganized) sector buys inputs from the other) studies for African countries show that the unorganized sector buys many inputs from the organized sector but not vice versa ([Hugon (1990)], [Grimm and Gunther (2005)], [Boehme and Thiele (2012)]). [Boehme and Thiele (2011)] find minor backward (IO) linkages between small unorganized and organized plants. [Paula and Scheinkman (2005)] find that in

Brazil own-sector linkages (within the unorganized sector) are more important than linkages with the other sector.

[Boehme and Thiele (2012)] use a survey of 5755 enterprises in urban Africa (the survey asks detailed questions about the sale/purchase of inputs and sources of inputs thus this analysis has much more direct measures of IO linkages). Their descriptive analysis reveals that about 80% of unorganized output is sold to final consumers. Further intermediate product sales are more important within the unorganized sector than from unorganized to organized sector. Thus they identify an asymmetry in the bi-directional flow of intermediates between the two sectors: the unorganized sector is more likely to buy from the unorganized sector than from the organized sector. This is an interesting contrast to our results for Indian manufacturing – we find that the *organized* sector is much more likely to buy inputs from the unorganized sector. Further they model the plant-level determinants of greater vertical linkages with the organized sector and find a positive correlation with size of the plants, education levels, access to credit and capital-stock.

For India recent studies have focused on the unorganized sector. [Ghani et al. (2011a)] identify four stylized facts about the unorganized sector (including both services and manufacturing) in India.

1. The unorganized sector is large, accounting for 99% of plants and 81% of employment.
2. The unorganized sector is persistent: the share of unorganized activity is very stable over long periods of time.
3. The persistence is not due to specific states or specific industries becoming more unorganized. It is a pervasive phenomenon that is true for all states and industries.
4. They find evidence that increasing concentration of unorganized economic activity weakens the production function for all manufacturing firms.

Further they find that unorganized sector shares fall when the size of the organized sector grows (there is a negative correlation between unorganized sector share and the rate of growth of organized sector). However an expansion of the organized sector does not shrink the *absolute* size of the unorganized sector. They also find that the share of unorganized sector falls as employment rises in large organized plants (those with employment greater than 500). This result identifies as important source of heterogeneity in the relationship between organized and

unorganized plants: size. They estimate an augmented production function that includes the unorganized sector share. They find that real output is lower in districts with greater share of unorganized sector.

[Moreno-Monroy et al. (2012)] directly address the importance of outsourcing or sub-contracting from the organized sector to the unorganized sector. Anecdotal evidence as well as case studies reveal that the organized sector in India uses the unorganized sector as a cheap supplier of inputs (manufacturing as well as service inputs). Organized sector firms may outsource their most labor-intensive tasks to unorganized sector so that they do not have to hire more workers (who are much harder to fire in case the firm needs to shrink or change product mix). This allows organized plants more flexibility and allows them to take advantage of lower unorganized sector wages.

Ahsan et al. combine data from ASI, NSS and Prowess to conduct state-industry level analysis and essentially identify horizontal linkages between organized and unorganized sectors. That is they ask whether greater organized presence in the same sector leads to greater unorganized presence. They interpret this result to mean that organized and unorganized sectors are complements due to possible agglomeration effects like labor market pooling, location of input suppliers and outsourcing by organized firms. However they do not explicitly identify vertical linkages (where organized sector buys inputs from unorganized sector and vice versa). They find that correlation between organized and unorganized sector activity is less than one and they interpret this as a move towards formalization: a 1 unit increase in organized activity leads to a less than 1 unit increase in unorganized activity. Further they find that horizontal linkages are affected by the capital-intensity of organized sector (greater capital intensity is associated with more outsourcing) and by state-level labor regulations.

[Moreno-Monroy et al. (2012)] combine various cross-sections of ASI and NSS to assess the impact of sub-contracting or outsourcing of manufactured products and services by the organized sector to the unorganized sector. They model the unorganized employment in a state-industry cell as a function of total organized sector sub-contracting (defined as the purchase value of goods sold in the same condition as purchased plus the cost of contract and commission work as a proportion of total cell output). They go one step further and test the modernization view of sub-contracting. This view avers that as the organized sector sub-contracts to the unorganized

sector it demands greater quality and productivity from the unorganized sector. That is, sub-contracting will increase the size of the overall unorganized sector particularly as the modern segment of the unorganized sector grows. Their main results are that sub-contracting (of both manufacturing and services) expands the modern segment of the unorganized sector. Further increased modernity in the unorganized sector reduces the overall size of the unorganized sector. This implies that most of the expansion in the unorganized sector is taking place in the traditional segment and that this expansion is reducing the modern segment. Thirdly they find that total organized employment is not correlated with total unorganized employment. That is there are no horizontal linkages between the organized and unorganized sector. Lastly they interpret their results to mean that the growth of the traditional segment is not due to production linkages. That is the unorganized sector (at least the traditional segment of it) is not growing in order to supply inputs to the organized sector. Only the modern segment is doing so.

Section III. Methodology

In order to quantify the spillovers that accrue from the organized sector to the unorganized sector and vice versa we use a simple approach. In order to capture these spillovers we use the theoretical and empirical model used to quantify spillovers from foreign direct investment (see [Javorcik (2004)] for an overview of this literature as well as an application).

a. Measure of Spillovers from the Unorganized Sector to the Organized Sector

In order to quantify the spillovers from the unorganized to the organized manufacturing sector with respect to employment, output and productivity we calculate the following measures of horizontal and vertical spillovers from unorganized manufacturing plants. Here j and k index industries, s indexes geographic location (state), and t time while the superscript U (O) refers to the unorganized (organized) sector. Let Y_{jst} refer to employment or real output or plant productivity in cell (j,s,t) . The presence of unorganized plants in this cell is captured by the following equation:

$$HORIZONTAL Y^U_{jst} = Y^U_{jst}, \forall Y \in \{Employment, Output, TFP\}$$

Using the horizontal index we construct a measure of forward linkages that captures the presence of unorganized plants in state s and in industries that supply to industry j .

$FORWARD Y_{jst}^U = \sum_{\forall k} \rho_{j,k} * HORIZONTAL Y_{kst}^U$, where $\rho_{j,k}$ is the share of industry j 's inputs purchased from industry k , and $\sum_{\forall k} \rho_{j,k} = 1 \forall j$. When Y is output or employment this index is the weighted total of unorganized suppliers' output or employment in state s . When Y is the total factor productivity of unorganized plants in that cell then this index measures the average productivity of unorganized sector suppliers to industry j weighted by input shares.

Further we construct a measure of backward linkages that captures the presence (or productivity) of unorganized plants in state s and in industries that buy from industry j :

$BACKWARD Y_{jst}^U = \sum_{\forall k} \varphi_{j,k} * HORIZONTAL Y_{kst}^U$, where $\varphi_{j,k}$ is the share of industry j 's inputs sold to industry k , and $\sum_{\forall k} \varphi_{j,k} = 1 \forall j$.

b. Measure of Spillovers from the Organized sector to the Unorganized Sector

Using notation and intuition from part (a) we measure the extent of spillovers from organized plants in a state-industry cell.

$HORIZONTAL Y_{jst}^O = Y_{jst}^O, Y \in \{Employment, Output, TFP\}$

$BACKWARD Y_{jst}^O = \sum_{\forall k} \varphi_{j,k} * HORIZONTAL Y_{kst}^O$, where $\varphi_{j,k}$ is the share of industry j 's inputs sold to industry k , and $\sum_{\forall k} \varphi_{j,k} = 1 \forall j$. This index of backward spillovers captures the presence (or productivity) of organized plants in state s and in industries that buy from industry j . Finally we measure forward spillovers as the weighted total (average) of organized suppliers' to inputs to industry j output or employment (TFP) in state s .

$FORWARD Y_{jst}^O = \sum_{\forall k} \rho_{j,k} * HORIZONTAL Y_{kst}^O$, where $\rho_{j,k}$ is the share of industry j 's inputs purchased from industry k , and $\sum_{\forall k} \rho_{j,k} = 1 \forall j$.

Section IV. Data

a. Data

We construct a time-series cross-section of the Indian unorganized manufacturing sector using establishment-level surveys carried out by the Government of India. The four snapshots of the

Indian manufacturing sector are available in 1989-90, 1994-95, 2000-01, and 2005-06.⁶ This section describes some key features of the data.⁷

The entire manufacturing sector is surveyed at regular intervals by the Government of India. The organized manufacturing sector is surveyed by the Central Statistical Organisation's Ministry of Statistics and Programme Implementation in the "Annual Survey of Industries" (hereafter "ASI"). Factories (establishments) employing 10 or more workers and using power (or 20 or more workers without using power) are required to register under the Factories Act, and these registered establishments comprise the ASI sampling frame. The largest plants, comprising what is known as the "Census scheme", are surveyed every year. The size threshold for the Census scheme has varied over the years, between 50 and 200 workers (see [Bollard et al. (2013)], Table A.1). The remaining plants (the "sample scheme") are sampled with state and 4-digit industry stratification based on the universe of registered establishments.

The "unorganized" manufacturing sector (those establishments falling outside the purview of the ASI scheme) has been separately surveyed by the National Sample Survey Organization's (NSSO) Survey of Unorganized Manufactures (hereafter, "NSS") in 1989, 1994, 2000 and 2005. The sampling frame of the NSS is constructed to capture all manufacturing enterprises not covered by the ASI, making the two surveys complements in comprising a full snapshot of the entire manufacturing sector in a given year.

Our principal fields of interest are commonly surveyed by both the ASI and NSS. These include output (as measured by sales volume), employment, materials expenditure and fixed capital. Capital is measured by the book value of fixed assets, and employment in our analysis is the typical definition of "persons engaged"-- including working owners, family and casual labor, and wage/salary employees.

We use a wholesale price index series available from India's Office of the Economic Adviser (Ministry of Commerce & Industry) to deflate output volumes to constant 1993-94 INR. To deflate raw materials values, we use the 1989-90 Input-Output table produced by the Central

⁶ Even though these surveys were undertaken over two fiscal years, for simplicity we refer below to the initial year only.

⁷ [Nataraj (2011)], [Kathuria et al. (2010)], [Hasan and Jandoc (2010)], and [Fernandes and Pakes (2010)] provide detailed overviews of similarly constructed databases.

Statistical Organization to construct wholesale input deflators (this process being similarly used by [Nataraj (2011)] among others).

We make a few sample restrictions. As is typical we remove any ASI observations which are reported as closed. We also exclude any service-sector establishments captured by the NSS. We also drop a small number of observations that are extreme outliers in the measure of output per worker and/or total output and/or total employment, report negative values for output, employees, or materials, or report zero or null persons engaged. Overall these restrictions remove a small percentage of the total observations from the underlying sample, and unreported robustness checks do not indicate major sensitivity to these restrictions. To avoid further concern regarding outliers we top-code and bottom-code the 1% tails (“Winsorizing”) of cell-level variables prior to the analysis described below.

During this long period of study industrial classifications were changed several times. We create a concordance between these classifications and the 1987 National industrial Classification (NIC) definitions. This leaves us with 180 approximately 3-digit industries. Because of the nature of the backwards and forwards linkages we model using input-output relationships, we then crosswalk the 180 NIC industries to 64 industrial groups which comprise the manufacturing sector in the 1989-90 input-output tables. Similarly, state definitions are concorded to pre-2001 definitions, leaving 23 states for a total of 1472 state-industry cells in a given year. We aggregate the establishment-level data to the state-industry level using the provided sampling weights (inverse of sampling probability) to construct population-level estimates of the commonly-covered accounts listed above.

During the course of our analysis we differentiate between two segments of the unorganized sector – the Household segment and the Non-Household segment. A large number of plants in the unorganized sector in India are very small household enterprises which mainly produce to subsist and employ family as workers. These enterprises have very low productivity and bad technology and are unlikely to be the main suppliers of inputs to organized plants (these are the plants characterized as “traditional” by [Moreno-Monroy et al. (2012)]). The other segment consists of plants (which account for most of unorganized sector employment and output) that are professional profit-maximizing enterprises (which we refer to as Non-Household and are characterized as “modern” by [Moreno-Monroy et al. (2012)]). These are the unorganized sector

plants that are likely to be the main suppliers of inputs to the organized sector. Tables 2 (a) and 2(b) show the differences between these two segments of the unorganized sector.

In order to measure changes in industrial policy, we use the detailed dataset of industrial policy in India constructed by [Sharma (2006a), Sharma (2006b)] and used in [Chamarbagwalla and Sharma (2011)]. Data on nominal tariffs are obtained from [Harrison et al. (2013)] for the period 1985-2007. A dummy variable indicating which 4-digit industries were FDI-deregulated in 1992 is taken from [Sivadasan (2009)] and combined with the ASI data to calculate the proportion of employment in a 3-digit industry exposed to FDI.

b. Plant-level Estimation of the Solow Residual

Before aggregating to the state-industry cell level, we estimate a simple formulation of plant-level multifactor productivity. We estimate the following simple production function for each state-industry cell separately (i is the index for plants).

$$Y_{it} = AL^{\alpha} K^{\beta} M^{\gamma} E^{\theta}$$

Using the log-log formulation and controlling for year fixed effects we extract the (Solow) residual from this regression. This residual is exponentiated and the weighted mean across plants forms our measure of cell-level multifactor productivity where the weight is the plants' share of cell output in each year.

c. Summary Statistics

The analysis is motivated by several compelling yet puzzling facts that emerge from recent research by [Ghani et al. (2011a)], [Mukim (2011)], [McMillan and Rodrik (2011)], [Kathuria et al. (2010)] and [Nataraj (2011)]. A few of them are listed below.

- a. The unorganized sector in India is extremely large in absolute and relative terms compared to the organized sector and compared to other countries at a similar stage of development. The presence of unorganized plants is more pervasive in services than in manufacturing. Yet the numbers for manufacturing are still extremely large – in 2005, 99% of establishments and 81% of employment in manufacturing were in the unorganized sector.

- b. The employment share of the unorganized sector is surprisingly persistent over time – it was 81% in 2005, same as in 1989.
- c. The contribution of the unorganized manufacturing sector to value added generated by the manufacturing sector is lower in magnitude – in 2005 32% of manufacturing value added was generated by unorganized plants – and has been falling over the last 50 years.
- d. There is anecdotal and some descriptive evidence that the unorganized sector provides important inputs for the organized sector. In 2005, 20% of surveyed unorganized plants reported that they had performed contract work. It is unclear how much of this was for the organized sector.
- e. State-industry cells with the strongest employment growth in large establishments experienced the greatest declines in unorganized sector share and size of employment. [Ghani et al. (2011a)].

Table 1 and Table 2 present summary statistics on plants, employment and output by year and by organized and unorganized sectors. While the unorganized sector comprises around 80 percent of employment in any given year, the organized sector contributes more than 80 percent of total real manufacturing output. Over the time period of study, employment in the organized sector has grown 32 percent, while employment in the unorganized sector has grown 17 percent.

Table 3 and Table 4 present a similar breakdown of the unorganized sector into household- and non-household-based establishments. One trend to note is the sharp rise in the prominence of non-household establishments, employment and output: in 1989, household-based establishments comprised more than 75 percent of unorganized sector employment; by 2005 this share had declined to below 60 percent. Trends in output shares are even more striking: in 1989, the two subsectors comprised about equal shares of total unorganized output; by 2005, 80 percent of output was being produced by non-household establishments.

Figure 1 presents a scatterplot of employment in the organized and unorganized state-industry-year clusters. The four panels progressively remove variation along the lines of state, industry and year, beginning with the data “as is” (top left) and ending with a depiction of a univariate version of the fixed-effects model we describe below. Even after removing cell fixed effects the relationship between unorganized and unorganized employment within the same industry remains (although as a substantially smaller magnitude).

Figure 2 performs the same exercise, but now showing the relationship between unorganized suppliers (forward index) to organized buyer industries. Although by the final panel the line appears quite flat, it still nonetheless does maintain a statistically significant slope (see regression analysis, Table 5 below). Figure 3 shows conversely the relationship between the organized buyer (backward) index to local unorganized industry cells. Again, although the line appears flat it remains a statistically significant slope in the empirical analysis.

Section V. Spillovers from the Unorganized Sector to the Organized Sector

We examine the employment and real output in 1472 state-industry cells based on the extent to which horizontal and vertical spillovers accrue from existing networks of unorganized plants in a given state-industry cell. In recent work [Ghani et al. (2011b)] and [Fernandes and Sharma (2012)] explain the concentration of organized plants in industry j across Indian states based on a rich vector of interaction terms between location characteristics and industry characteristics. For example plants in industry j may choose to locate in state s because the state has properties that are uniquely suited to industry j . The interactions between state and industry attributes should be viewed as the comparative advantage that location s has for industry j . Assuming that these comparative advantage factors don't change substantially over time we can adequately model them by including the full vector of state-industry fixed effects. Our focus is on an additional consideration for organized sector plants while choosing their location: the presence (and quality) of the unorganized plants (particularly those that supply inputs to organized plants) that are located in that state-industry cell.

Our first estimation equation models employment and real output of organized sector plants in (j,s,t) . We include the indices for unorganized presence in horizontal, backward and forward industries. Additionally organized sector plants may choose to locate in state-industry cells that contain more productive unorganized plants. Hence we include the average TFP of unorganized plants in horizontal, forward and backward industries. Further organized plants may locate in (j,s,t) because of the presence of *organized* sector suppliers and buyers and so we control for forward and backward linkages with other organized plants. I^{js} and I^t are, respectively, industry-state and year fixed effects, and ε_{jst} are independent and identically distributed (i.i.d.) residuals which can represent a random element in firm location decisions or a set of unobservable local attributes.

Equation (1) $Y_{jst}^o =$

$$\begin{aligned} & \beta_1 HORIZONTAL Y_{jst}^u + \beta_2 FORWARD Y_{jst}^u + \beta_3 BACKWARD Y_{jst}^u + \delta_1 TFP_{jst}^u + \\ & \delta_2 FORWARD TFP_{jst}^u + \delta_3 BACKWARD TFP_{jst}^u + \gamma_1 FORWARD Y_{jst}^o + \\ & \gamma_2 BACKWARD Y_{jst}^o + \alpha + I^{js} + I^t + \varepsilon_{ijt} \end{aligned}$$

If the coefficient on horizontal spillovers (β_1) is positive then a larger unorganized sector is associated with a larger organized manufacturing sector in cell (j,s,t) or that the organized and unorganized sectors are complementary to each other. If the coefficient on horizontal linkages is negative then it would imply that organized and unorganized manufacturing are competitors (i.e. foes). There is ample anecdotal and some research evidence that the organized sector in India is dependent on the unorganized sector for purchase of inputs (both material and service). A positive coefficient on β_2 would provide some evidence for this. In that case our results would imply that organized sector plants tend to choose locations with a larger presence of unorganized suppliers. A priori we don't have an expectation about the sign of β_3 since it is unlikely that the unorganized sector is a large buyer of inputs from the organized sector. Together the coefficients β_1 , β_2 and β_3 represent other-sector spillovers that accrue to the organized sector. Analogously coefficients γ_1 and γ_2 represent own-sector spillovers that accrue to the organized sector.

Table 5 and Table 6 show the results from estimating Equation (1) for employment and real output respectively. In all specifications we cluster standard errors by state-industry cells. This allows us to correct for within-cell serial correlation in the error term. In column 1 we include only the horizontal, forward and backward spillovers from the unorganized sector. In column 2 we include the proxies for the quality of the unorganized sector by including the average TFP of unorganized plants in horizontal and vertically linked industries located in state s . In column 3 we include the presence of forward and backward linked *organized* plants in the state. In column 4 we test the robustness of our results to the inclusion of state-year and industry-year fixed effects. These fixed effects capture any changes in the state environment over time (for example a state improves its infrastructure or the overall agglomeration of economic activity in the state changes) as well as changes in industry characteristics over time (for example increasing use of foreign inputs due to trade liberalization) that may affect the concentration of organized plants in each state-industry cell.

We find evidence of positive and statistically significant horizontal spillovers from unorganized sector employment and real output on the real output of the organized sector. That is organized sector economic activity is greater in state-industry cells which also have greater unorganized sector activity. Further we find evidence of positive forward spillovers from unorganized sector and that this coefficient is larger for real output compared to employment. Thus a 10% rise in employment (output) of unorganized sector *suppliers* increases the employment (output) of the organized sector buyers by 16% (12.6%). Note that this effect is robust to the inclusion of state-year and industry-year fixed effects.

A priori we did not expect to find much effect of backward spillovers from the unorganized sector to the organized sector hence it is not surprising β_3 is not significant. This is likely due to the fact that most unorganized plants are very small household operations that are unlikely to purchase inputs from organized plants which are typically much larger and more productive and produce sophisticated products.

In Column 3 of Table 5 and Table 6 we introduce controls for the quality of unorganized plants (proxied by total factor productivity). Notably unorganized TFP in horizontally linked industries has very small or insignificant effect on the size of the organized sector. One interpretation of this result is that higher quality in the unorganized sector does not squeeze the size of the organized sector by providing incentive for plants to stay unorganized. We find some evidence that after we control for time-varying state and industry effects the total factor productivity of the unorganized sector in *supplying* industries (the forward spillover) boosts organized sector real output (but not employment). Surprisingly we find evidence that more productive unorganized plants in sectors that *purchase from* organized sector (the backward spillover) induce greater output in organized sector plants.

We also find evidence of vertical linkages between organized sector industries located in the same state -- *own-sector spillovers*. Column 3 of Table 5 and Table 6 show that even after we control for these own-type spillovers we still continue to see positive and significant spillovers from the unorganized sector -- *other-sector spillovers*. A 10% increase in employment (output) of organized sector sellers of inputs to industry j in state s leads to a 14% (29.8%) rise in organized sector employment (output). However once we control for time-varying state and industry trends the effect becomes statistically insignificant. The backward own-type spillover is strong and

significant even after including these controls – a 10% rise in output of organized buyers of industry j 's products leads to an 81.6% rise in organized sector output in industry j .

Thus the *own-sector* backward linkages (presence of *organized sector buyers*) are much larger and stronger than *own-sector* forward linkages. Further *other-sector* forward linkages are larger and stronger than *other-sector* backward linkages. Our results seem to imply that organized sector plants are more dependent on *organized buyer* networks and *unorganized supplier* networks existing in a state-industry cell. This result is intuitive and is supported by anecdotal evidence.

Main States

In Table 7 we test the robustness of our results to restricting the sample to 17 main states (AP, Bihar, Delhi, Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerela, Maharashtra, Madhya Pradesh, Orissa, Pondicherry, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal). One reason for this is that data from some of the smaller states is noisier and contains many more empty state-industry cells. In column 1 of the table we estimate the standard specification and in column 2 we include state-year and industry-year fixed effects. We continue to find evidence of positive horizontal and forward spillovers from the unorganized sector to the organized sector particularly for employment (the coefficient on forward output spillovers is insignificant).

Section VI. Spillovers from the Organized Sector to the Unorganized Sector

One major innovation and advantage of our regression framework is that we can answer the same question – are the organized and unorganized sectors friends, foes or family? – from two different angles. In Section V we demonstrated that the organized sector does benefit from positive horizontal and forward spillovers from the unorganized sector. That is as unorganized suppliers in a state-industry cell expand the organized sector expands. Now we ask whether the unorganized sector expands when the organized sector (in particular organized buyers of inputs) expands in a state-industry cell. This new way of looking at the relationship between the two sectors will also allow us to get a sense of how important the spillovers are to each sector. Is the organized sector more important to the unorganized sector or vice versa?

Analogous to Section V we model the employment and real output of unorganized plants in (j,s,t). Note that the coefficient of interest is the one on backward spillovers. This measures the weighted sum of employment (output) of organized sector plants located in state s that *purchase* inputs from the unorganized sector. A priori we expect β'_2 to be positive – as the size of organized increases it purchases more inputs from the unorganized sector.

Equation (2) $Y^U_{jst} =$

$$\begin{aligned} & \beta'_1 HORIZONTAL Y^O_{jst} + \beta'_2 BACKWARD Y^O_{jst} + \beta'_3 FORWARD Y^O_{jst} + \delta'_1 TFP^O_{jst} + \\ & \delta'_2 BACKWARD TFP^O_{jst} + \delta'_3 FORWARD TFP^O_{jst} + \gamma'_1 BACKWARD Y^U_{jst} + \\ & \gamma'_2 FORWARD Y^U_{jst} + \alpha + I^j + I^t + \varepsilon_{ijt} \end{aligned}$$

Table 8 and Table 9 show the results from estimating this equation for employment and real output. We find very strong evidence of employment and output spillovers from the organized sector to the unorganized sector. This is true in all specifications for horizontal and backward spillovers and largely true for forward spillovers. A 10% rise in employment (output) of organized buyers leads to a 16.13% (134.1%) increase in employment (output) of unorganized plants in that cell.

These results are robust to inserting controls for the quality of organized plants in the state-industry cell (Column 2). We find that the quality of the organized sector in the same state-industry cell (TFP^O_{jst}) positively affects the employment and output of unorganized plants (though the coefficient on the latter is insignificant). Thus it seems that a productive organized sector at the very least does not squeeze out the unorganized sector.

We also find that productivity of the organized sector in backward-linked industries (those that purchase inputs from industry j) has a positive effect on unorganized sector employment and real output. This is consistent with the story that as the organized sector gets more productive it demands more and better quality inputs. The unorganized sector responds by expanding employment and may accruing benefits from returns to scale. Notably it seems that productivity of the unorganized sector is more important for the organized sector than vice versa. That is, the coefficient on the TFP terms in Table 5 and Table 6 are larger than those in Table 8 and Table 9.

Lastly when we focus on *own-sector* spillovers – those from vertically linked unorganized plants – we observe some conflicting trends. Greater employment in unorganized sector buyers (the backward spillover) leads to greater unorganized sector employment in that cell but greater. On the other hand greater output of unorganized sector buyers reduces the overall unorganized sector output of that cell. There is little robust evidence of forward spillovers from unorganized buyers to unorganized sector output or employment.

Pooling together the results of *own-sector* and *other-sector* spillovers it seems that unorganized plants have greater employment in state-industry cells that contain more unorganized and organized *buyers* of their product. Supply-side linkages (forward) are less important and less robust for unorganized plants. This is consistent with the case where the unorganized sector plants produce less processed items that require few inputs.

Notably *own-sector* spillovers existed in the organized sector as well. However there we found that backward linkages were positive and significant (Table 5 and Table 6) in explaining organized sector employment and output. On the other hand *own-sector* forward linkages had little to no effect on organized sector size. Thus it seems that both organized and unorganized sector plants seem to locate in states which contain more *own-sector* buyers of their products. In contrast organized sector plants tend to locate in states with more *other-sector* suppliers of inputs. Unorganized plants tend to locate in states with more *other-sector* buyers of their products.

Main States

The main results regarding spillovers from the organized sector to the unorganized sector are robust to restricting the sample to the 17 main states (Table 10).

Section VII. Productivity Spillovers

a. Organized Sector TFP

Now that we have established evidence that the size of the organized sector is positively related to the size of the unorganized sector within a state and vice versa we turn to the question of productivity. In particular we expect that as the unorganized sector gets more productive it will be able to supply better quality and lower cost inputs to the organized sector. This in turn will

raise the productivity of the organized sector. Thus we model the total factor productivity of the average organized plant in each state-industry cell in the following way.

$$\begin{aligned} \textbf{Equation (3)} \quad TFP_{jst}^O = & \beta_1 HORIZONTAL TFP_{jst}^U + \beta_2 FORWARD TFP_{jst}^U + \\ & \beta_3 BACKWARD TFP_{jst}^U + \delta_1 Y_{jst}^U + \delta_2 FORWARD Y_{jst}^U + \delta_3 BACKWARD Y_{jst}^U + \\ & \gamma_1 FORWARD TFP_{jst}^O + \gamma_2 BACKWARD TFP_{jst}^O + \alpha + I^j + I^t + \varepsilon_{ijt} \end{aligned}$$

Note that TFP of plants depend on several industry and state characteristics which we capture via the state-industry fixed effects. If the coefficient on TFP of unorganized plants in the same state-industry cell (β_1) is positive then a more productive unorganized sector is associated with a more productive organized sector. However if β_1 is negative then it would imply that organized and unorganized manufacturing are competitors (i.e. foes). This would be consistent with a model where high productivity businesses and entrepreneurs choose to stay in the unorganized sector. Further we expect that β_2 – the coefficient on the average TFP of unorganized suppliers to industry j that are located in state s – is positive. Thus more productive suppliers in the unorganized sector increase the productivity of organized sector plants.

We also include controls for the size of the unorganized sector (the variables $Y_{jst}^U, FORWARD Y_{jst}^U, BACKWARD Y_{jst}^U$). It is conceivable that a large and diverse unorganized sector boosts the productivity of organized plants. We also include controls for the productivity of *organized* suppliers ($FORWARD TFP_{jst}^O$) and organized buyers ($BACKWARD TFP_{jst}^O$) related to industry j that are located in state s .

Table 11 shows the results from estimating Equation 3. We find that neither the productivity nor the size of the unorganized sector in horizontal or forward linked industries affects the productivity of organized sector plants. This lack of productivity linkages is consistent with a system where the unorganized sector supplies very rudimentary (low value added) inputs to the organized sector in which case the productivity of the unorganized sector suppliers is a non-issue. Nonetheless this result is puzzling and requires further investigation. Note that own-sector productivity spillovers show the same puzzling patterns as the other-sector spillovers. Organized sector TFP is positively correlated with the TFP of organized buyers of their products but shows negative or zero correlation with the TFP of organized suppliers of inputs.

b. Unorganized Sector TFP

Completely analogous to the exercise above we model the productivity of the average unorganized sector plant in each state-industry cell. We expect that as the organized sector in the same state-industry cell gets more productive there may be competitive pressure on the unorganized sector to catch up. On the other hand a highly productive organized sector may leave little scope for the unorganized sector leading to negative spillovers. Further as the productivity of organized sector buyers of inputs rises they may expect better quality and lower costs from their unorganized suppliers. To test these theories we estimate the following equation.

$$\begin{aligned} \textbf{Equation (4)} \quad TFP_{jst}^U = & \beta_1 HORIZONTAL TFP_{jst}^O + \beta_2 FORWARD TFP_{jst}^O + \\ & \beta_3 BACKWARD TFP_{jst}^O + \delta_1 Y_{jst}^O + \delta_2 FORWARD Y_{jst}^O + \delta_3 BACKWARD Y_{jst}^O + \\ & \gamma_1 FORWARD TFP_{jst}^U + \gamma_2 BACKWARD TFP_{jst}^U + \alpha + I^j + I^t + \varepsilon_{ijt} \end{aligned}$$

Table 12 shows the results. We find that productivity of organized plants in the same state-industry cell does not raise or lower the productivity of unorganized plants. Thus the sectors are neither friends nor foes with respect to productivity. We find large and significant backward spillovers – when the productivity of organized buyers rises it is associated with greater productivity in the unorganized sector. Further we find that greater employment in organized sector buyers also boosts unorganized sector productivity. Thus larger, more productive organized sector buyers boost employment, output and productivity in the unorganized sector. This result is intuitive and is supported by ample anecdotal evidence. We provide one of the first empirical confirmations of that evidence.

Our results reveal another asymmetry in the relationship between the organized sectors. In Section VI we found that the unorganized sector is more dependent on organized buyers of its products than organized buyers are on unorganized suppliers. Now we find that unorganized sector productivity is more dependent on productivity and employment in organized buyers than vice versa.

Section VIII. Lagged Spillovers between the Organized and Unorganized Sectors: The Issue of Jobless Growth

a. Lagged Spillovers from the Unorganized Sector to the Organized Sector

In this section we present a specification that asks whether the organized sector chooses as its location the states which already contain a large and diverse unorganized sector. That is rather than measure contemporaneous spillovers we look for lagged spillovers. The specification uses the fact that while we have only four years of unorganized sector data we have many more years of organized sector data spanning the years 1980-2007. Thus we can associate unorganized sector data in (2005, 2000, 1994, 1989) to organized sector data in (2007, 2002, 1995, 1991) respectively. However if we don't use the 2005 unorganized survey then we can create greater leads of the organized sector activity. The specification equation is given below.

Equation (5) $Y_{jst+k}^O =$

$$\begin{aligned} & \beta_1 \text{HORIZONTAL } Y_{jst}^U + \beta_2 \text{FORWARD } Y_{jst}^U + \beta_3 \text{BACKWARD } Y_{jst}^U + \delta_1 \text{TFP}_{jst}^U + \\ & \delta_2 \text{FORWARD TFP}_{jst}^U + \delta_3 \text{BACKWARD TFP}_{jst}^U + \gamma_1 \text{FORWARD } Y_{jst}^O + \\ & \gamma_2 \text{BACKWARD } Y_{jst}^O + \alpha + I^{js} + I^t + I^{jt} + I^{st} \epsilon_{ijt} \end{aligned}$$

Positive coefficients on the β 's would imply that there is greater organized economic activity in year t in state-industry cells that had more unorganized sector activity in previous years. Table 13 and Table 14 show the results from this exercise. Each panel specification includes state-year and industry-year fixed effects. Standard errors are clustered by state-industry. We find little consistent evidence that organized manufacturing activity is greater in state-industry cells that contain larger networks of unorganized suppliers of inputs. While two year leads of organized employment are positively related to current employment in unorganized suppliers this relationship turns negative when we consider 4 and 9 years leads. Few of the coefficients are significant when we consider real output of the organized sector as the dependent variable. Thus while ancillary unorganized industry is important for the organized sector it is not necessarily an important factor in the choice of location (i.e. state-industry cell) by organized sector plants.

b. Lagged Spillovers from the Organized Sector to the Unorganized Sector

In this section we ask whether unorganized plants choose their locations based on the extent to organized sector activity that is already located in the state. That is, is greater organized sector

presence in period $t-k$ associated with greater unorganized sector presence in period t within a state-industry cell?

This specification is particularly important since the issue of jobless growth is an important one facing Indian policy makers. The standard wisdom of encouraging large scale organized industry (which by itself may be highly capital-intensive and may not generate a lot of jobs) to locate in a particular state is that ancillary enterprises (which supply important inputs to the organized sector) will follow. A large proportion of these ancillaries will be in the unorganized sector. Thus we should see a positive relationship between current unorganized output and employment and lagged organized output and employment. However if there is truly jobless growth there will be no (or even a negative) relationship. Our framework allows us to test for this.

Note that we have only four years of unorganized sector data but many more years of organized sector data. Thus we can link unorganized data in the years (1989, 1994, 2000, 2005) with organized sector data in (1989-k, 1994-k, 2000-k, 2005-k), $k \leq 9$.

Equation (6) $Y_{jst}^U =$

$$\begin{aligned} & \beta'_1 HORIZONTAL Y_{jst-k}^O + \beta'_2 BACKWARD Y_{jst-k}^O + \beta'_3 FORWARD Y_{jst-k}^O + \\ & \delta'_1 TFP_{jst-k}^O + \delta'_2 BACKWARD TFP_{jst-k}^O + \delta'_3 FORWARD TFP_{jst-k}^O + \\ & \gamma'_1 BACKWARD Y_{jst-k}^U + \gamma'_2 FORWARD Y_{jst-k}^U + \alpha + I^{js} + I^{jt} + I^{st} + I^t + \varepsilon_{ijt} \end{aligned}$$

Note that we do not include current other-type spillovers in the estimation equation. That is because these are likely to be correlated with lagged other-type spillovers. But we do control for time-varying state and industry fixed effects which will capture the strength of contemporaneous spillovers.

Table 15 and Table 16 show the results from estimating Equation (6) for lags of 2, 4 and 9 years. Columns 2, 4 and 6 contain state-year and industry-year fixed effects while Columns 1, 3, and 5 do not. We find that backward spillovers from organized sector employment are significant at lags of 4 years but not for lags of 2 or 9 years. Backward linkages in real output exist only for lags of 9 years. We can compare this weak and inconsistent evidence on the presence of *other-sector* backward spillovers to the evidence for *own-sector* backward spillovers which are strong and positive for 2 and 4 year lags of employment and for 2 and 9 year lags of real output.

We interpret these results as consistent with jobless growth in manufacturing. Even at the lag of 9 years an increase in the concentration of organized sector plants (in the same or in buying sectors) is not associated with an increase in employment in the unorganized sector.

Section IX. Discussion and Conclusion

This paper is a detailed analysis of the vertical and horizontal linkages that exist between the organized and unorganized segments of the manufacturing sector. Our results support anecdotal evidence that the unorganized sector is an important supplier of inputs to the organized manufacturing sector. In particular organized sector employment and output is greater in states that have greater presence of unorganized suppliers of inputs. Conversely unorganized employment and output is greater in states that have greater presence of organized buyers of inputs. We identify two important asymmetries in the relationship between the organized and unorganized sectors. First the unorganized sector is much more dependent on/responsive to organized sector presence than vice versa. Second unorganized sector productivity is dependent on/responsive to organized sector productivity and presence but the reverse is not true.

Some of our results are markedly different from existing studies. For example, in Africa unorganized firms are important buyers of inputs from organized firms. On the other hand the organized sector does not buy much from the organized sector. This is contrary to our finding that the unorganized sector is an important supplier of inputs to the organized sector.

We find that there are strong linkages between the household (“traditional”) segment of the unorganized sector and the organized sector. Based on [Moreno-Monroy et al. (2012)] our expectations were to find little or no links. Of course consistent with [Moreno-Monroy et al. (2012)] we do find that vertical linkages are stronger between the “modern”/non-household segment of the unorganized sector.

Additionally [Moreno-Monroy et al. (2012)] find that horizontal linkages are insignificant. On the contrary we find large, positive and significant horizontal linkage between the organized and unorganized sector in all specifications.

Our results seem to imply that all industrial policy -- which is usually targeted towards the organized sector -- must take into account the large employment and output spillovers that exist between the organized and unorganized sectors.

Secondly it is worrying that the organized sector does not seem to get productivity benefits from the unorganized sector despite the size of employment and output spillovers. This could be due to the fact that the most rudimentary, unsophisticated tasks/inputs are sourced from the unorganized sector. Policies that improve technology, quality and productivity in the unorganized sector may be needed to induce the organized sector to outsource higher end tasks. This may increase the extent of productivity spillovers from the unorganized to the organized sector.

Lastly our results imply that large contemporaneous employment and output spillovers are no guarantee against jobless growth. Most employment generation in manufacturing occurs in the unorganized sector. Thus if the goal of industrial policy is to boost employment, primarily through organized manufacturing, then policy makers must pay attention to the magnitude and direction of organized-unorganized linkages.

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Figures and Tables

Figure 1: Correlation between Organized and Unorganized Employment in Horizontal Industries

Figure 2: Correlation between Organized Employment and Employment by Unorganized Suppliers

Figure 3: Correlation between Unorganized Employment and Employment by Organized Buyers

Table 1: Plant Counts, Employment and Output—by Sector

	Sector	1989	1994	2000	2005
Plants	ASI	92,811	111,309	116,079	123,537
	NSS	13,084,964	11,816,828	14,476,212	14,050,853
Employment (in 000s)	ASI	6,391	7,625	7,485	8,498
	NSS	24,970	27,272	30,626	29,229
Output (in MM constant 1993 INR)	ASI	2,845,875	3,515,452	4,827,560	7,089,280
	NSS	392,262	640,241	1,378,260	1,422,800

Source: Authors' calculations using Annual Survey of Industries and National Sample Survey data.

Table 2: Shares of Plants Counts, Employment and Output – by Sector

	Sector	1989	1994	2000	2005
Plants	ASI	1%	1%	1%	1%
	NSS	99%	99%	99%	99%
Employment (in 000s)	ASI	20%	22%	20%	23%
	NSS	80%	78%	80%	77%
Output (in MM constant 1993 INR)	ASI	88%	85%	78%	83%
	NSS	12%	15%	22%	17%

Source: Authors' calculations using Annual Survey of Industries and National Sample Survey data.

Table 3: Plant Counts, Employment and Output - by Plant Location

		1989	1994	2000	2005
Plants	Household	10,283,963	8,692,467	10,221,653	10,274,968
	Non-household	2,801,001	3,093,324	4,253,446	3,765,933
	Unknown	0	31,036	1,113	9,951
Employment (in 000s)	Household	19,293	17,934	18,160	17,018
	Non-household	5,677	9,277	12,464	12,192
	Unknown	0	60	2	19
Output (in MM constant 1993 INR)	Household	201,312	231,277	318,568	279,341
	Non-household	190,950	407,673	1,059,623	1,142,656
	Unknown	0	1,292	70	803

Source: Authors' calculations using Annual Survey of Industries and National Sample Survey data.

Table 4: Shares of Plant Counts, Employment & Output - By Plant Location

		1989	1994	2000	2005
Plants	Household	79%	74%	71%	73%
	Non-household	21%	26%	29%	27%
	Unknown	0%	0%	0%	0%
Employment (in 000s)	Household	77%	66%	59%	58%
	Non-household	23%	34%	41%	42%
	Unknown	0%	0%	0%	0%
Output (in MM constant 1993 INR)	Household	51%	36%	23%	20%
	Non-household	49%	64%	77%	80%
	Unknown	0%	0%	0%	0%

Source: Authors' calculations using Annual Survey of Industries and National Sample Survey data.

Table 5: Organized Sector Log (Employment)

	(1)	(2)	(3)	(4)
<i>Other-Sector Employment Spillovers</i>				
Horizontal Employment Spillovers from Unorganized Sector	0.1805*** (0.0202)	0.1631*** (0.0184)	0.1424*** (0.0164)	0.0512*** (0.0144)
Forward Employment Spillovers from Unorganized Sector	0.2604++ (0.1890)	0.2946+ (0.1831)	0.0940 (0.1769)	1.6027** (0.6885)
Backward Employment Spillovers from Unorganized Sector	0.2309* (0.1206)	0.1668++ (0.1215)	0.4742*** (0.1145)	0.3246 (0.8240)
<i>Other-Sector Productivity Spillovers</i>				
Average TFP of Horizontal-linked Unorganized Plants		0.0249 (0.0449)	0.0185 (0.0435)	0.0118 (0.0418)
Average TFP of Forward-linked Unorganized Plants		0.2199* (0.1311)	0.0398 (0.1332)	-0.9905** (0.4919)
Average TFP of Backward-linked Unorganized Plants		0.4326*** (0.0975)	0.1469+ (0.0938)	-0.1833 (0.4414)
<i>Own-Sector Employment Spillovers</i>				
Forward Employment Spillovers from Organized Sector			1.4155*** (0.2752)	-0.8653 (0.7876)
Backward Employment Spillovers from Organized Sector			1.2749*** (0.1559)	0.4528 (0.5919)
Constant	-1.2768 (2.5831)	-2.8268 (2.5669)	-31.7320*** (4.4228)	-9.3435 (15.5799)
Observations	5888	5888	5888	5888
R-squared	0.0951	0.1042	0.1433	0.3373

*Note: All specifications contain panel (state-industry) fixed effects as well as year fixed effects. Standard errors are clustered at the state-industry level. Column 4 includes state-year and industry-year fixed effects. Significance at the 20% level is indicated by ++, at the 15% level by +, at the 10% level by *, at the 5% level by ** and at the 1% level by ***.*

Table 6: Organized Sector Log (Real Output)

	(1)	(2)	(3)	(4)
<i>Other-sector Output Spillovers</i>				
Horizontal Output Spillovers from Unorganized Sector	0.1621*** (0.0198)	0.1484*** (0.0189)	0.1369*** (0.0180)	0.0461*** (0.0166)
Forward Output Spillovers from Unorganized Sector	1.1971*** (0.2882)	0.9779*** (0.2813)	0.4887* (0.2713)	1.2599+ (0.8141)
Backward Output Spillovers from Unorganized Sector	0.2429 (0.2080)	0.1359 (0.2092)	-0.0855 (0.2174)	-0.4675 (0.6127)
<i>Other-sector Productivity Spillovers</i>				
Average TFP of Horizontal-linked Unorganized Plants		0.1213 (0.1187)	0.1022 (0.1164)	0.0567 (0.1140)
Average TFP of Forward-linked Unorganized Plants		0.4182 (0.4057)	0.0475 (0.4188)	5.0691** (2.1266)
Average TFP of Backward-linked Unorganized Plants		1.0400*** (0.2858)	0.8365*** (0.2782)	0.8628++ (0.6061)
<i>Own-sector Output Spillovers</i>				
Forward Output Spillovers from Organized Sector			2.9809*** (0.8080)	0.2618 (1.6961)
Backward Output Spillovers from Organized Sector			1.5398*** (0.4685)	8.1626*** (1.3833)
Constant	-17.8146*** (6.7159)	-15.1925** (6.4844)	-105.9709*** (19.8544)	-221.0172*** (44.1513)
Observations	5888	5888	5888	5888
R-squared	0.0896	0.0946	0.1065	0.2855

*Note: All specifications contain panel (state-industry) fixed effects as well as year fixed effects. Column 4 includes state-year and industry-year fixed effects. Standard errors are clustered at the state-industry level. Significance at the 20% level is indicated by ++, at the 15% level by +, at the 10% level by *, at the 5% level by ** and at the 1% level by ***.*

Table 7: Organized Log(Employment) and Log(Real Output): Sub- sample Main States

	(1)	(2)	(3)	(4)
	Employment		Real Output	
<i>Other-sector Employment Spillovers</i>				
Horizontal Employment Spillovers from Unorganized Sector	0.1552*** (0.0184)	0.0469*** (0.0163)		
Forward Employment Spillovers from Unorganized Sector	0.0652 (0.2070)	2.0531** (0.8152)		
Backward Employment Spillovers from Unorganized Sector	0.4445*** (0.1298)	1.0713** (0.4797)		
<i>Other-sector Productivity Spillovers</i>				
Average TFP of Horizontal-linked Unorganized Plants	-0.0056 (0.0430)	-0.0038 (0.0406)	-0.0011 (0.1145)	-0.0217 (0.1093)
Average TFP of Forward-linked Unorganized Plants	-0.0038 (0.1614)	-0.7937** (0.3863)	-0.1157 (0.4855)	9.8805*** (2.2549)
Average TFP of Backward-linked Unorganized Plants	0.1743+ (0.1093)	-0.5479++ (0.4255)	0.9763*** (0.3217)	0.8713 (0.7202)
<i>Own-sector Employment Spillovers</i>				
Forward Employment Spillovers from Organized Sector	1.6194*** (0.3384)	-1.8836** (0.9540)		
Backward Employment Spillovers from Organized Sector	1.4876*** (0.1775)	1.7075*** (0.5061)		
<i>Other-sector Output Spillovers</i>				
Horizontal Output Spillovers from Unorganized Sector			0.1513*** (0.0214)	0.0417** (0.0195)
Forward Output Spillovers from Unorganized Sector			0.4670+ (0.3038)	-0.0588 (0.7613)
Backward Output Spillovers from Unorganized Sector			-0.1473 (0.2620)	-0.3540 (0.8018)
<i>Own-sector Output Spillovers</i>				
Forward Output Spillovers from Organized Sector			3.8611*** (0.9374)	1.1547 (1.9170)
Backward Output Spillovers from Organized Sector			1.7203*** (0.5568)	10.7908*** (1.4388)
Constant	-34.4485*** (5.2770)	-24.2966** (11.4007)	- (23.5197)	- (40.5045)
Observations	4352	4352	4352	4352
R-squared	0.1743	0.4173	0.1290	0.3606

*Note: All specifications contain panel (state-industry) fixed effects as well as year fixed effects. Columns 2 and 4 include state-year and industry-year fixed effects. Standard errors are clustered by the state-industry level. Significance at the 20% level is indicated by ++, at the 15% level by +, at the 10% level by *, at the 5% level by ** and at the 1% level by ***.*

Table 8: Unorganized Sector Log (Employment)

	(1)	(2)	(3)	(4)
<i>Other-sector Employment Spillovers</i>				
Horizontal Employment Spillovers from Organized Sector	0.2720*** (0.0321)	0.2407*** (0.0288)	0.2291*** (0.0286)	0.0816*** (0.0237)
Forward Employment Spillovers from Organized Sector	0.7649** (0.2978)	0.1034 (0.2897)	0.1616 (0.2757)	2.7174*** (0.9145)
Backward Employment Spillovers from Organized Sector	1.1563*** (0.1831)	1.2431*** (0.1773)	1.3892*** (0.1699)	1.6135*** (0.3313)
<i>Own-sector Productivity Spillovers</i>				
Average TFP of Horizontal-linked Organized Plants		0.1107* (0.0630)	0.1051* (0.0622)	0.1171** (0.0556)
Average TFP of Forward-linked Organized Plants		0.6123*** (0.1484)	0.5691*** (0.1494)	-0.3226 (0.5059)
Average TFP of Backward-linked Organized Plants		0.6162*** (0.1457)	0.6008*** (0.1472)	0.7733** (0.3157)
<i>Own-sector Employment Spillovers</i>				
Forward Employment Spillovers from Unorganized Sector			0.3721 (0.3179)	0.9449 (1.1316)
Backward Employment Spillovers from Unorganized Sector			0.9511*** (0.1581)	1.2050** (0.5338)
Constant	-17.4252*** (3.8514)	-15.7545*** (3.6970)	-33.1262*** (5.4266)	-69.1314*** (14.5748)
Observations	5888	5888	5888	5888
R-squared	0.0837	0.1030	0.1131	0.3488

*Note: All specifications contain panel (state-industry) fixed effects as well as year fixed effects. Column 4 also includes state-year and industry-year fixed effects. Standard errors are clustered by the state-industry level. Significance at the 20% level is indicated by ++, at the 15% level by +, at the 10% level by *, at the 5% level by ** and at the 1% level by ***.*

Table 9: Unorganized Sector Log (Real Output)

	(1)	(2)	(3)	(4)
<i>Other-sector Output Spillovers</i>				
Horizontal Output Spillovers from Organized Sector	0.1793*** (0.0225)	0.1621*** (0.0213)	0.1629*** (0.0214)	0.0536*** (0.0197)
Forward Output Spillovers from Organized Sector	3.6859*** (0.7183)	2.1427*** (0.7114)	1.9212** (0.7528)	-14.6519*** (2.1219)
Backward Output Spillovers from Organized Sector	2.6649*** (0.4557)	2.9723*** (0.4568)	2.6609*** (0.4791)	13.4094*** (1.6483)
<i>Other-sector Productivity Spillovers</i>				
Average TFP of Horizontal- linked Organized Plants		0.1672 (0.1592)	0.1636 (0.1589)	0.1768 (0.1466)
Average TFP of Forward-linked Organized Plants		1.5690*** (0.3698)	1.3165*** (0.4003)	7.5149*** (0.9809)
Average TFP of Backward- linked Organized Plants		0.6165* (0.3606)	0.5523+ (0.3621)	2.9682*** (0.8707)
<i>Own-sector Output Spillovers</i>				
Forward Output Spillovers from Unorganized Sector			0.2965 (0.3167)	-2.1341*** (0.7546)
Backward Output Spillovers from Unorganized Sector			0.4615** (0.2264)	-1.3021*** (0.4499)
Constant	-142.3842*** (18.6009)	-120.8439*** (17.4443)	-123.2268*** (17.3951)	75.0451** (29.1958)
Observations	5888	5888	5888	5888
R-squared	0.0752	0.0844	0.0860	0.2831

*Note: All specifications contain panel (state-industry) fixed effects as well as year fixed effects. Column 4 also includes state-year and industry-year fixed effects. Standard errors are clustered by the state-industry level. Significance at the 20% level is indicated by ++, at the 15% level by +, at the 10% level by *, at the 5% level by ** and at the 1% level by ***.*

Table 10: Unorganized Sector Log (Employment) and Log (Real Output): Sub- sample Main States

	(1)	(2)	(3)	(4)
	Employment		Real Output	
<i>Other-sector Employment Spillovers</i>				
Horizontal Employment Spillovers from Organized Sector	0.2626*** (0.0347)	0.0835*** (0.0303)		
Forward Employment Spillovers from Organized Sector	0.1941 (0.3345)	3.1788*** (1.2138)		
Backward Employment Spillovers from Organized Sector	1.6498*** (0.2086)	1.9515*** (0.4197)		
<i>Other-sector Productivity Spillovers</i>				
Average TFP of Horizontal-linked Organized Plants	0.1288** (0.0630)	0.1400** (0.0572)	0.2102++ (0.1621)	0.2170++ (0.1507)
Average TFP of Forward-linked Organized Plants	0.6328*** (0.1839)	-0.2588 (0.6561)	1.3932*** (0.4883)	7.7140*** (1.2367)
Average TFP of Backward-linked Organized Plants	0.6549*** (0.1760)	0.6369+ (0.3875)	0.4836 (0.4344)	2.6044*** (0.9898)
<i>Own-sector Employment Spillovers</i>				
Forward Employment Spillovers from Unorganized Sector	0.3533 (0.3740)	0.9201 (1.2870)		
Backward Employment Spillovers from Unorganized Sector	1.2230*** (0.1822)	2.0634*** (0.5535)		
<i>Other-sector Output Spillovers</i>				
Horizontal Output Spillovers from Organized Sector			0.1968*** (0.0280)	0.0545** (0.0268)
Forward Output Spillovers from Organized Sector			1.6621* (0.9108)	-15.7211*** (2.8303)
Backward Output Spillovers from Organized Sector			2.6949*** (0.5933)	14.4461*** (2.0230)
<i>Own-sector Output Spillovers</i>				
Forward Output Spillovers from Unorganized Sector			0.3873 (0.3780)	-1.6927* (0.9001)
Backward Output Spillovers from Unorganized Sector			0.5417* (0.2793)	-1.3090** (0.5999)
Constant	-39.4178*** (6.5028)	-86.5682*** (17.9159)	-121.0611*** (20.0264)	68.6633*** (32.6279)
Observations	4352	4352	4352	4352
R-squared	0.1409	0.3858	0.0998	0.3156

*Note: All specifications contain panel (state-industry) fixed effects as well as year fixed effects. Columns 2 and 4 also includes state-year and industry-year fixed effects. Standard errors are clustered by the state-industry level. Significance at the 20% level is indicated by ++, at the 15% level by +, at the 10% level by *, at the 5% level by ** and at the 1% level by ***.*

Table 11: Organized Sector log (TFP)

	(1)	(2)	(3)	(4)
<i>Other-sector Productivity Spillovers</i>				
Average TFP of Horizontal-linked Unorganized Plants	0.0183 (0.0183)	0.0134 (0.0183)	0.0107 (0.0179)	0.0098 (0.0181)
Average TFP of Forward-linked Unorganized Plants	0.0954*** (0.0292)	0.0602* (0.0324)	0.0257 (0.0336)	-0.1797 (0.2845)
Average TFP of Backward-linked Unorganized Plants	-0.0110 (0.0280)	-0.0250 (0.0281)	-0.0127 (0.0284)	0.2228** (0.0899)
<i>Other-sector Output Spillovers</i>				
Horizontal Output Spillovers from Unorganized Sector		0.0038** (0.0015)	0.0029* (0.0015)	0.0023+ (0.0016)
Forward Output Spillovers from Unorganized Sector		0.0410++ (0.0300)	0.0116 (0.0303)	-0.0567 (0.1634)
Backward Output Spillovers from Unorganized Sector		0.0211 (0.0184)	0.0028 (0.0184)	0.0480 (0.0674)
<i>Own-sector Productivity Spillovers</i>				
Average TFP of Forward-linked Organized Plants			0.0092 (0.0331)	-0.1731++ (0.1232)
Average TFP of Backward-linked Organized Plants			0.2006*** (0.0345)	0.3846*** (0.1067)
Constant	0.2676*** (0.0961)	-0.9520++ (0.6672)	-0.6520 (0.6647)	-0.3140 (2.3653)
Observations	5888	5888	5888	5888
R-squared	0.0143	0.0172	0.0302	0.1089

*Note: All specifications contain panel (state-industry) fixed effects as well as year fixed effects. Column 4 contains state-year and industry-year fixed effects. Standard errors are clustered by the state-industry level. Significance at the 20% level is indicated by ++, at the 15% level by +, at the 10% level by *, at the 5% level by ** and at the 1% level by ***.*

Table 12: Unorganized Sector log (TFP)

	(1)	(2)	(3)	(4)
<i>Other-sector Productivity Spillovers</i>				
Average TFP of Horizontal-linked Organized Plants	0.0161 (0.0184)	0.0125 (0.0182)	0.0115 (0.0180)	0.0107 (0.0179)
Average TFP of Forward-linked Organized Plants	0.0325 (0.0324)	-0.0007 (0.0326)	-0.0793** (0.0336)	-0.2853*** (0.0895)
Average TFP of Backward-linked Organized Plants	0.0840*** (0.0295)	0.0712** (0.0303)	0.0791*** (0.0300)	0.1377* (0.0745)
<i>Other-sector Employment Spillovers</i>				
Horizontal Employment Spillovers from Organized Sector		0.0121** (0.0052)	0.0099* (0.0052)	0.0035 (0.0056)
Forward Employment Spillovers from Organized Sector		0.1528*** (0.0545)	0.0449 (0.0548)	0.1352 (0.1985)
Backward Employment Spillovers from Organized Sector		0.0872*** (0.0307)	0.0303 (0.0303)	0.1462** (0.0700)
<i>Own-sector Productivity Spillovers</i>				
Average TFP of Forward-linked Unorganized Plants			0.1751*** (0.0398)	0.2492++ (0.1838)
Average TFP of Backward-linked Unorganized Plants			0.1725*** (0.0302)	0.2182** (0.0980)
Constant	0.0093 (0.1360)	-2.4737*** (0.6940)	-1.4736** (0.6771)	-3.4996** (1.4269)
Observations	5888	5888	5888	5888
R-squared	0.0189	0.0243	0.0433	0.1360

*Note: All specifications contain panel (state-industry) fixed effects as well as year fixed effects. Column 4 contains state-year and industry-year fixed effects. Standard errors are clustered by the state-industry level. Significance at the 20% level is indicated by ++, at the 15% level by +, at the 10% level by *, at the 5% level by ** and at the 1% level by ***.*

Table 13: Organized Sector Log (Employment): Lag Specification

	(1) Lead = 2	(2) Lead = 4	(3) Lead = 9
<i>Other-sector Employment Spillovers</i>			
Horizontal Employment Spillovers from Unorganized Sector	0.0157 (1.31)	-0.0150 (-0.93)	-0.0100 (-0.68)
Forward Employment Spillovers from Unorganized Sector	4.700*** (5.55)	-5.396*** (-3.84)	-3.590*** (-3.41)
Backward Employment Spillovers from Unorganized Sector	3.140** (3.08)	2.252*** (4.68)	1.125** (2.84)
<i>Other-sector Productivity Spillovers</i>			
Average TFP of Horizontal-linked Unorganized Plants	0.00870 (0.28)	0.0471 (1.00)	-0.0400 (-0.92)
Average TFP of Forward-linked Unorganized Plants	2.552*** (3.57)	-0.577 (-1.24)	-0.944 (-1.86)
Average TFP of Backward-linked Unorganized Plants	-0.992 (-1.90)	0.470 (1.88)	0.458 (1.51)
<i>Own-sector Employment Spillovers</i>			
Forward Employment Spillovers from Organized Sector	-2.159** (-2.78)	0.659 (1.36)	1.096* (2.05)
Backward Employment Spillovers from Organized Sector	2.984*** (4.10)	0.0256 (0.07)	-0.698* (-2.56)
Constant	-99.69*** (-5.19)	33.71 (1.92)	29.75* (2.47)
Observations	5888	4416	4416

*Note: All specifications contain panel (state-industry) fixed effects as well as year fixed effects. All specifications include state-year and industry-year fixed effects. Standard errors are clustered at the state-industry level. Significance at the 10% level is indicated by *, at the 5% level by ** and at the 1% level by ***.*

Table 14: Organized Sector Log (Real Output): Lag Specification

	(1) Lead = 2	(2) Lead = 4	(3) Lead = 9
<i>Other-sector Output Spillovers</i>			
Horizontal Output Spillovers from Unorganized Sector	0.00668 (0.58)	-0.0109 (-0.70)	-0.0250 (-1.72)
Forward Output Spillovers from Unorganized Sector	-0.560 (-0.83)	1.549* (2.07)	1.278 (1.56)
Backward Output Spillovers from Unorganized Sector	-0.321 (-0.71)	0.343 (0.71)	-0.420 (-0.84)
<i>Other-sector Productivity Spillovers</i>			
Average TFP of Horizontal-linked Unorganized Plants	0.00543 (0.08)	0.0552 (0.53)	-0.0427 (-0.44)
Average TFP of Forward-linked Unorganized Plants	4.125* (2.36)	-0.0310 (-0.02)	-1.298 (-1.15)
Average TFP of Backward-linked Unorganized Plants	-0.892* (-2.29)	0.798 (1.18)	0.182 (0.24)
<i>Own-sector Output Spillovers</i>			
Forward Output Spillovers from Organized Sector	-3.463** (-3.16)	-5.042* (-2.02)	-1.824 (-0.89)
Backward Output Spillovers from Organized Sector	2.129** (2.74)	-2.473* (-2.10)	-3.539* (-2.54)
Constant	52.27** (2.66)	148.0** (3.02)	123.6*** (3.38)
Observations	5888	4416	4416

*Note: All specifications contain panel (state-industry) fixed effects as well as year fixed effects. All specifications include state-year and industry-year fixed effects. Standard errors are clustered at the state-industry level. Significance at the 10% level is indicated by *, at the 5% level by ** and at the 1% level by ***.*

Table 15: Unorganized Sector Log (Employment): Lag Specification

	(1)	(2)	(3)	(4)	(5)	(6)
	RHS Lag = 2	RHS Lag = 2	RHS Lag = 4	RHS Lag = 4	RHS Lag = 9	RHS Lag = 9
<i>Other-sector Employment Spillovers</i>						
Horizontal Employment Spillovers	-0.00167	0.0329	-0.120***	0.00713	-0.0990**	-0.0369
from Organized Sector	(-0.07)	(1.38)	(-3.93)	(0.30)	(-3.21)	(-1.35)
Forward Employment Spillovers	0.622*	-0.758	0.839**	-0.0450	0.746*	2.088*
from Organized Sector	(2.10)	(-1.12)	(2.98)	(-0.07)	(2.48)	(2.41)
Backward Employment Spillovers	0.829***	0.673	0.697**	1.061**	0.868**	0.428
from Organized Sector	(5.01)	(1.92)	(3.10)	(3.06)	(3.20)	(0.67)
<i>Other-sector Productivity Spillovers</i>						
Average TFP of Horizontal-linked	0.165	0.0529	0.188	-0.0683	0.0461	-0.0816
Organized Plants	(1.34)	(0.46)	(1.63)	(-0.65)	(0.40)	(-0.77)
Average TFP of Forward-linked	0.116	-0.0465	-0.594*	-0.943	-0.549**	1.200
Organized Plants	(0.84)	(-0.10)	(-2.57)	(-1.27)	(-2.71)	(1.43)
Average TFP of Backward-linked	0.704***	0.931	-0.395	-0.585	-1.581***	-0.498
Organized Plants	(3.68)	(1.44)	(-1.91)	(-0.65)	(-6.60)	(-0.81)
<i>Own-sector Spillovers</i>						
Forward Employment Spillovers	0.494	1.710*	0.455	-1.352	0.353	-1.228
from Unorganized Sector	(1.34)	(2.42)	(1.29)	(-1.17)	(1.00)	(-1.41)
Backward Employment Spillovers	1.111***	1.238*	1.120***	2.675***	1.178***	0.451
from Unorganized Sector	(6.92)	(2.31)	(6.71)	(4.05)	(7.17)	(1.05)
Constant	-31.45***	-30.93*	-26.88***	-18.13	-24.72***	-14.67
	(-5.48)	(-2.02)	(-5.03)	(-1.13)	(-4.39)	(-1.14)
N	5888	5888	5888	5888	5888	5888

*Note: All specifications contain panel (state-industry) fixed effects as well as year fixed effects. Columns 2, 4 and 6 contain state-year and industry-year fixed effects while Columns 1, 3, and 5 do not. Standard errors are clustered at the state-industry level. Significance at the 10% level is indicated by *, at the 5% level by ** and at the 1% level by ***.*

Table 16: Unorganized Sector Log (Real Output): Lag Specification

	(1)	(2)	(3)	(4)	(5)	(6)
	RHS Lag = 2	RHS Lag = 2	RHS Lag = 4	RHS Lag = 4	RHS Lag = 9	RHS Lag = 9
<i>Other-sector Output Spillovers</i>						
Horizontal Output Spillovers	0.0435	0.0493	-0.0583	0.0477	-0.0477	-0.0217
from Organized Sector	(1.48)	(1.71)	(-1.86)	(1.65)	(-1.41)	(-0.66)
Forward Output Spillovers	0.439	-0.471	1.568*	1.446	2.815***	1.179
from Organized Sector	(0.62)	(-0.29)	(2.15)	(1.29)	(4.68)	(1.08)
Backward Output Spillovers	1.378**	1.437*	-0.217	0.634	0.260	10.76***
from Organized Sector	(3.09)	(2.05)	(-0.44)	(0.51)	(0.46)	(8.43)
<i>Other-sector Productivity Spillovers</i>						
Average TFP of Horizontal-linked	0.464	0.262	0.380	-0.103	-0.108	-0.236
Organized Plants	(1.48)	(0.86)	(1.28)	(-0.37)	(-0.37)	(-0.85)
Average TFP of Forward-linked	0.486	-2.654**	-1.047	1.729	-1.160*	0.277
Organized Plants	(1.34)	(-2.69)	(-1.84)	(0.45)	(-2.33)	(0.20)
Average TFP of Backward-linked	2.041***	4.860*	-0.128	-4.783	-4.086***	-16.73***
Organized Plants	(3.96)	(2.41)	(-0.23)	(-1.31)	(-6.42)	(-14.57)
<i>Own-sector Output Spillovers</i>						
Forward Output Spillovers	1.477***	4.500***	1.326***	-1.313	1.320***	6.846***
from Unorganized Sector	(4.83)	(4.43)	(4.40)	(-1.01)	(4.56)	(8.43)
Backward Output Spillovers	1.147***	0.831*	1.203***	-0.0268	1.307***	3.657***
from Unorganized Sector	(5.16)	(2.18)	(5.33)	(-0.04)	(5.81)	(7.04)
Constant	-70.83***	-118.8***	-64.79***	8.592	-88.78***	-392.0***
	(-6.43)	(-5.24)	(-4.23)	(0.22)	(-6.10)	(-12.02)
N	5888	5888	5888	5888	5888	5888

*Note: All specifications contain panel (state-industry) fixed effects as well as year fixed effects. Columns 2, 4 and 6 contain state-year and industry-year fixed effects while Columns 1, 3, and 5 do not. Standard errors are clustered at the state-industry level. Significance at the 10% level is indicated by *, at the 5% level by ** and at the 1% level by ***.*

Appendix I. Sources of Heterogeneity in Other-Sector Spillovers

Now that we have established the presence of contemporaneous horizontal and vertical spillovers between the organized and unorganized sectors for the average state-industry cell we are in a position to ask second order questions. In particular we ask which industry, state and plant characteristics affect the size and magnitudes of these spillovers? Do industrial policy reforms (like tariff liberalization) reduce forward spillovers from the unorganized to the organized sector? Are these forward spillovers greater for labor-intensive industries? Is the size of vertical spillovers greater in some states than in others?

a. Industrial Policy Reforms

India underwent a series of industrial policy reforms in the 1980s and 1990s that were aimed at releasing the manufacturing sector from draconian licensing requirements, high tariffs and barriers to foreign direct investment. Several studies have documented the effect of these reforms on various aspects of the organized manufacturing sector (see [Chamarbagwalla and Sharma (2011)], [Sivadasan (2009)] and [Topalova and Khandelwal (2011)] for more details). In this section we amend our main estimation equations and interact the other-sector spillover terms with proxies for these reforms. Our motivation is that major industrial policy reforms change the cost of foreign inputs leading to changes in the demand for domestic inputs; increase competition and hence push manufacturing plants to desire cheaper/better inputs; lead to entry of foreign owned plants that may have different supply networks than domestic plants. Whether these changes in the quantity and quality demanded of domestic inputs enhance or reduce other-sector complementarities is an empirical question.

Appendix Table I. 1 and Appendix Table I. 2 respectively show the results for employment and real output in the organized sector. In order to identify the coefficient on the reform variables (which vary at the industry-year level) we do not include industry-year fixed effects in these specifications. However we do control for state-year fixed effects. In the first column of table we control for de-licensing reform measured as the proportion of industry output that was de-licensed, in Column 2 the reform variable is the negative of final goods tariffs and in column 3 the reform variable is the proportion of industry output that was liberalized for foreign direct investment. Our main findings are the following.

- The average effect of the reforms on organized sector employment and real output is negligible. The exception is delicensing which is associated with a decline in organized sector real output.
- De-licensing and FDI liberalization reduced the extent of horizontal employment spillovers from unorganized plants to organized plants while trade liberalization raised the extent of these spillovers (the coefficient on Reforms*Horizontal Spillovers from Unorganized sector).
- De-licensing significantly enhanced forward spillovers from the unorganized sector. Thus the dependence of organized plants on unorganized suppliers of inputs is larger in de-licensed industries. These reforms removed entry barriers and onerous output limits on organized sector plants. Intuitively then it makes sense that industries with expanding incumbent plants as well as new plants would have greater demand for inputs particularly from the unorganized sector.
- Trade liberalization enhanced horizontal spillovers and reduced forward spillovers from the unorganized sector. In order to survive increased competition from foreign goods organized plants may be forced to upgrade their inputs requirements (to better quality/more sophisticated inputs) and this may lead to unorganized suppliers being squeezed out. Note that trade liberalization enhanced own-sector forward spillovers. That is trade liberalized organized plants are purchasing more inputs from organized suppliers rather than from unorganized suppliers.
- We note that the reforms seem to have affected employment more than real output in almost all specifications.

In Appendix Table I. 3 and Appendix Table I. 4 we model the employment and output of the unorganized sector and include interactions of the reforms with spillover terms. We note that the industrial policy reforms were primarily targeted toward the organized sector and so we do not have any priors as to the effect of these reforms in the unorganized sector. Our main findings are the following.

- De-licensing and FDI liberalization reduced output of the unorganized sector (the latter effect is statistically significant effect) in the average state-industry cell but had no

significant effect on unorganized sector employment. On the other hand trade liberalization raised employment in the unorganized sector.

- De-licensing and FDI liberalization reduced the extent of horizontal spillovers from the organized sector while trade liberalization enhanced horizontal spillovers. These results are consistent with those relating to the organized sector. Overall it appears that de-licensing and FDI liberalization reduced the extent of friendly relations between the organized and unorganized sectors.
- When we examine the extent of backward spillovers (which measure the presence of organized buyers of inputs from the unorganized sector) we don't find many significant coefficients. De-licensing enhanced backward output spillovers (with no significant effect on backward employment spillovers). Trade reforms reduced backward employment spillovers (no significant effect on output spillovers). FDI liberalization had no effect on the extent of spillovers. Combined with the results from our model of organized sector employment and output this seems to imply that de-licensing, FDI liberalization and trade reforms increased the importance of the unorganized sector suppliers to the organized sector but not the importance of organized sector buyers to the unorganized sector.
- We don't find any consistent story when we examine the strength of own-sector spillovers. Some reforms enhance them while others reduce them.

b. Industrial Characteristics : Labor-intensity and Skill-intensity

An important characterization of the relationship between the organized and unorganized sector in India is that the organized sector uses the unorganized sector as supplier of low-tech labor-intensive inputs that it does not want to produce in-house. Further the nature of the unorganized sector in India (characterized by very small plants, mostly family owned and producing relatively low value added products) is such that it is not able to supply very sophisticated inputs to the organized sector.

We define labor intensity as the ratio of the industry's manual worker wage bill over the industry's gross sales. Then we calculate the median ratio over all industries in each year. We create a dummy variable that identifies industries whose labor intensity is greater than that of the median industry and interact this indicator with the proxies for own- and other-sector spillovers.

Appendix Table I. 5 shows the results when we model the employment and output of the organized sector.

- We find that more labor intensive industries have enhanced horizontal output and employment spillovers from the unorganized sector.
- But there is no evidence of enhanced forward spillovers from the unorganized suppliers of inputs in that state-industry cell. Thus more labor-intensive organized industries do not necessarily expand when their unorganized suppliers expand.
- We find that organized plants in more labor-intensive industries have stronger vertical linkages with *organized* plants. That is own-sector spillovers are stronger in labor-intensive industries. This result is counter intuitive since one would expect that organized sector plants would buy more sophisticated inputs from other organized plants and that this would be more important for relatively capital-intensive industries.

Similarly we define skill intensity as the ratio of an industry's skilled worker wage bill to its total wage bill and define a skill intensive industry as the one with greater than median ratio.

- We find that more skill intensive organized industries have more horizontal spillovers with the unorganized sector. Skill intensity does not seem to affect the extent of forward spillovers from the unorganized sector.
- Skill intensity seems to strengthen *own-sector* spillovers within the organized sector. This is intuitive since more skill intense industries require modern sophisticated inputs that are more likely to be produced by organized plants.

In Appendix Table I. 6 we model employment and output in the unorganized sector. We find that in industries where the organized plants are highly labor-intensive the unorganized sector accrues much greater backward linkages from the organized sector. Thus as employment and output of labor intensive organized buyers their demand for inputs from the unorganized sector rises and this in turn leads to expansion of the unorganized sector.

Unorganized sector plants have stronger horizontal spillovers from the organized sector in skill-intensive industries. Counter-intuitively backward linkages are also stronger in skill-intensive industries. This implies that skill-intensive organized industries are more important buyers of unorganized sector products.

c. Plant Characteristics: Household versus Non-Household Unorganized Sector Plants

As mentioned in Section IV the household segment of unorganized plants consists of small, family-owned and run units characterized by low productivity and small size. The non-household sector consists of plants (which account for most of unorganized sector employment and output) that are professional profit-maximizing enterprises. The non-household segment plants are the ones most likely to supply to the organized sector as pointed out in [Moreno-Monroy et al. (2012)]. Our analysis is a much more complete characterization of the relationship between the organized and unorganized sectors and we would like to check whether the relationship is different for household and non-household segments of the unorganized sector.

We re-calculate all our spillover indices by restricting the sample of unorganized plants to those that declare themselves non-household enterprises (as captured in the survey instrument by the “location of enterprise” field) and those that declare themselves household enterprises.

i. Organized Sector Employment and Output

Appendix Table I. 7 and Appendix Table I. 8 provide the results from modelling organized sector employment and output as a function of unorganized sector spillover indices from the non-household and household sector respectively. Columns 2 and 4 include state-year and industry-year fixed effects while Columns 1 and 3 do not.

We find that horizontal and forward spillovers from the unorganized non-household sector are positive and significant. A 10% rise in employment (output) of non-household unorganized suppliers raises organized sector employment by 24.7% (11.7%). For the household sector only employment spillovers are significant. A 10% rise in employment in unorganized household suppliers enhances organized sector employment by 26.2%. For the entire population of unorganized sector plants Table 5 and Table 6 showed that a 10% rise in employment (output) of unorganized suppliers led to a 16% (12.5%) rise in organized employment (output).

Three important themes emerge. Contrary to expectation (and to the results from [Moreno-Monroy et al. (2012)]) we see sizeable linkages between the “traditional”/low productivity/tiny size segment of the unorganized sector and the organized sector. Secondly output spillovers

from the non-household sector are the same magnitude as those from the household sector. It is in the employment spillovers that we see the expected result that the non-household sector is more important supplier of inputs to the organized sector. Lastly spillover estimates from the entire unorganized sector are much smaller than the ones emerging from the household and non-household sub-sectors. This reinforces the importance of studying each sub-sector individually.

ii. Unorganized sector Output and Employment

In Appendix Table I. 10 we model household-based unorganized sector employment and output as a function of organized sector spillovers. We find that after we control for state-year and industry-year fixed effects (Columns 2 and 4) there are no backward spillovers in employment while a 10% rise in output of organized buyers leads to a 74.2% rise in output of household-based unorganized plants.

When we restrict our analysis to the non-household unorganized sector in Appendix Table I. 9 we find that 10% rise in output of organized sector buyers leads to a 111.7% rise in non-household unorganized sector output but a 10% rise in organized employment leads to a 44% decline in household sector unorganized employment. A theme emerges that organized sector buyers are more important for the non-household sub-sector than for the household sub-sector of the unorganized sector. Further input-output linkages seem to have greater output effects than employment effects for both the household and non-household sub-sectors.

d. Plant Characteristics: Plant Size

An important result that emerges from [Ghani et al. (2011a)] is that different segments of the organized sector may have different relations with the unorganized sector. In particular the paper finds that as the share of unorganized sector falls as employment rises in large organized plants (those with employment greater than 500). This result identifies an important source of heterogeneity in the relationship between organized and unorganized plants: expansion of large organized plants reduces the relative size of the unorganized sector. Large organized plants tend to be highly capital- and skill-intensive and tend to use sophisticated, modern inputs which are not produced by the unorganized sector. Smaller plants in the organized sector are likely to use the kind of inputs that are produced by the unorganized sector. A priori we would expect to see greater vertical linkages between smaller organized plants and the unorganized sector.

We split the organized sector into three size classes. These estimations are structured similarly to the household/non-household regressions, but with unorganized sector employment/output as the dependent variable and employment/output (own sector, forward and backward indices) separated by size class for the organized sector as explanatory variables. For simplicity, we construct three size classes of organized sector plants: small plants with less than 50 employees, medium-sized plants with 51 to 150 employees, and large plants with greater than 150 employees. We estimate the following equation for each of the size classes.

Equation (7) $Y_{jst}^U =$

$$\beta_1 HORIZONTAL Y_{jst}^{O,Size} + \beta_2 FORWARD Y_{jst}^{O,Size} + \beta_3 BACKWARD Y_{jst}^{O,Size} +$$

$$\delta_1 TFP_{jst}^{O,Size} + \delta_2 FORWARD TFP_{jst}^{O,Size} + \delta_3 BACKWARD TFP_{jst}^{O,Size} +$$

$$\gamma_1 FORWARD Y_{jst}^U + \gamma_2 BACKWARD Y_{jst}^U + \alpha + I^j + I^t + \varepsilon_{ijt}$$

The results of this estimation are presented in Appendix Table I. 11 and Appendix Table I. 12 which show the employment and output linkages between all unorganized plants and small, medium and large organized plants respectively.

Further we assess the effect of total unorganized employment (via horizontal and vertical linkages) on the employment and output of small, medium-sized and large organized plants. For each size category we estimate the following equation.

Equation (8) $Y_{jst}^{O,Size} =$

$$\beta_1 HORIZONTAL Y_{jst}^U + \beta_2 FORWARD Y_{jst}^U + \beta_3 BACKWARD Y_{jst}^U + \delta_1 TFP_{jst}^U +$$

$$\delta_2 FORWARD TFP_{jst}^U + \delta_3 BACKWARD TFP_{jst}^U + \gamma_1 FORWARD Y_{jst}^O +$$

$$\gamma_2 BACKWARD Y_{jst}^O + \alpha + I^j + I^t + \varepsilon_{ijt}$$

Appendix Table I. 13 and Appendix Table I. 14 show the linkages between small, medium and large organized plant employment and output respectively and unorganized sector employment.

When modeling organized sector employment and output we find significant horizontal spillovers for all size categories. Forward spillovers from unorganized plants are insignificant for small organized plants but increasingly large and significant for medium-sized and large organized plants. A 10% rise in employment of unorganized suppliers leads to an 8.18% (16.8%)

rise in the employment of medium-sized (large) organized plants. Thus we do not find evidence for the hypothesis that smaller organized sector size classes are more closely linked with the unorganized sector.

When modeling unorganized sector employment and output we find strong evidence that the unorganized sector is more responsive in terms of employment—particularly among own-sector and backwards-linked (buyer) organized sector firms in the smallest size classes. A 10% rise in the employment of small organized buyers leads to 17.9% rise in output of unorganized plants while a 10% rise in employment of large organized buyers leads to a 4.6% rise in unorganized employment. This suggests that growth among smaller-size organized sector plants has a larger effect in “pulling along” own sector and supplier unorganized sector plants relative to growth in larger-size organized sector plants. That is, small and medium size plants appear to exhibit a closer relationship with the unorganized sector than do larger manufacturers.

Two puzzles arise out of the results. Earlier we had identified an asymmetry: unorganized plants are more dependent on organized plants (of any size) than vice versa. However this does not seem to hold once we take size into account. Spillovers from organized plants to unorganized plants are larger in magnitude. Secondly the patterns shown by output spillovers are very different from those shown by employment spillovers. This is the first clear specification in which the employment and real output results are contradictory to each other in magnitude and significance. More research is needed to investigate these puzzles.

Appendix Table I. 1: Effect of Reforms on Organized Sector Log (Employment)

	(1) De-licensing	(2) Trade Liberalization	(3) FDI Liberalization
<i>Other-sector Employment Spillovers</i>			
Horizontal Employment Spillovers from Unorganized Sector	0.1473*** (0.0226)	0.1770*** (0.0182)	0.1305*** (0.0166)
Backward Employment Spillovers from Unorganized Sector	0.4228*** (0.1142)	0.6319*** (0.1424)	0.5070*** (0.1135)
Forward Employment Spillovers from Unorganized Sector	0.1177 (0.1730)	-0.2009 (0.2148)	0.1677 (0.1777)
Reform	-0.9419 (0.9728)	-0.0064 (0.0127)	-0.7522 (2.4141)
Reform*Horizontal Spillovers from Unorganized sector	-0.0466** (0.0199)	0.0011*** (0.0002)	-0.0555** (0.0238)
Reform*Forward Spillovers from Unorganized sector	0.1551** (0.0766)	-0.0020** (0.0009)	0.0848 (0.1362)
Reform*Backward Spillovers from Unorganized sector	0.1539*** (0.0444)	0.0015** (0.0007)	0.0721 (0.0805)
<i>Other-sector Productivity Spillovers</i>			
Average TFP of Horizontal-linked Organized Plants	0.2255*** (0.0427)	0.2283*** (0.0429)	0.2262*** (0.0431)
Average TFP of Backward-linked Organized Plants	0.3817*** (0.1064)	0.4068*** (0.1052)	0.4553*** (0.1115)
Average TFP of Forward-linked Organized Plants	0.3387*** (0.1090)	0.2723** (0.1145)	0.2859*** (0.1095)
<i>Own-sector Employment Spillovers</i>			
Forward Employment Spillovers from Organized Sector	0.9891*** (0.2537)	1.2869*** (0.2546)	1.0483*** (0.2437)
Backward Employment Spillovers from Organized Sector	1.3650*** (0.1657)	1.2281*** (0.1544)	1.3991*** (0.1523)
Reform*Forward Spillovers from Organized sector	-0.1285* (0.0768)	0.0019* (0.0011)	-0.2108 (0.2238)
Reform*Backward Spillovers from Organized sector	-0.0622 (0.0763)	-0.0016* (0.0010)	0.1107 (0.1334)
Constant	-30.1597*** (4.3677)	-30.9048*** (4.2954)	-32.6377*** (4.2795)
Observations	5888	5888	5888
R-squared	0.2038	0.2083	0.1992

*Note: All specifications contain panel (state-industry) fixed effects as well as year fixed effects. All specifications also include state-year fixed effects. Standard errors are clustered by the state-industry level. Significance at the 20% level is indicated by ++, at the 15% level by +, at the 10% level by *, at the 5% level by ** and at the 1% level by ***.*

Appendix Table I. 2: Effect of Reforms on Organized Sector Log (Real Output)

	(1)	(2)	(3)
	De-licensing	Trade Liberalization	FDI Liberalization
<i>Other-sector Output Spillovers</i>			
Horizontal Output Spillovers from Unorganized Sector	0.1571*** (0.0281)	0.1919*** (0.0225)	0.1244*** (0.0185)
Backward Output Spillovers from Unorganized Sector	-0.5854** (0.2596)	-0.4467* (0.2703)	-0.3623* (0.2184)
Forward Output Spillovers from Unorganized Sector	0.1151 (0.3163)	0.0706 (0.3222)	0.2926 (0.2715)
Reform	-17.1911** (7.9290)	0.0664 (0.0896)	9.9640 (12.3753)
Reform*Horizontal Spillovers from Unorganized sector	-0.0593** (0.0279)	0.0015*** (0.0003)	0.0019 (0.0327)
Reform*Forward Spillovers from Unorganized sector	0.5175* (0.2696)	-0.0041+ (0.0026)	0.1346 (0.4132)
Reform*Backward Spillovers from Unorganized sector	0.2702++ (0.1938)	-0.0036+ (0.0023)	0.0607 (0.2934)
<i>Other-sector Productivity Spillovers</i>			
Average TFP of Horizontal-linked Organized Plants	0.8420*** (0.1042)	0.8553*** (0.1050)	0.8348*** (0.1066)
Average TFP of Backward-linked Organized Plants	1.2035*** (0.3143)	1.2542*** (0.3024)	1.2650*** (0.3097)
Average TFP of Forward-linked Organized Plants	1.3701*** (0.3347)	0.9954*** (0.3302)	1.3844*** (0.3339)
<i>Own-sector Output Spillovers</i>			
Forward Output Spillovers from Organized Sector	1.5278* (0.8429)	2.1071** (0.8189)	1.7179** (0.7875)
Backward Output Spillovers from Organized Sector	1.7593*** (0.4942)	2.5071*** (0.5328)	2.1933*** (0.4660)
Reform*Forward Spillovers from Organized sector	-0.2928 (0.2906)	-0.0030 (0.0033)	-0.5286 (0.5463)
Reform*Backward Spillovers from Organized sector	0.3815++ (0.2709)	0.0044+ (0.0029)	-0.0130 (0.3891)
Constant	-65.5925*** (20.7742)	-99.1099*** (19.3816)	-88.6925*** (18.5293)
Observations	5888	5888	5888
R-squared	0.1650	0.1673	0.1577

*Note: All specifications contain panel (state-industry) fixed effects as well as year fixed effects. All specifications also include state-year fixed effects. Standard errors are clustered by the state-industry level. Significance at the 20% level is indicated by ++, at the 15% level by +, at the 10% level by *, at the 5% level by ** and at the 1% level by ***.*

Appendix Table I. 3: Effect of Reforms on Unorganized Sector Log (Employment)

	(1)	(2)	(3)
	De-licensing	Trade Liberalization	FDI Liberalization
<i>Other-sector Employment Spillovers</i>			
Horizontal Employment Spillovers from Organized Sector	0.3499*** (0.0416)	0.3117*** (0.0344)	0.2225*** (0.0298)
Backward Employment Spillovers from Organized Sector	1.3286*** (0.1954)	1.0602*** (0.1818)	1.4175*** (0.1720)
Forward Employment Spillovers from Organized Sector	0.1016 (0.2715)	0.2099 (0.3030)	0.1415 (0.2734)
Reforms	-0.6272 (1.2758)	0.0393** (0.0173)	-4.5688 (3.9059)
Reform*Horizontal Spillovers from Organized sector	-0.1909*** (0.0315)	0.0022*** (0.0003)	-0.0460++ (0.0340)
Reform*Backward Spillovers from Organized sector	-0.0786 (0.1168)	-0.0055*** (0.0015)	0.0701 (0.1831)
Reform*Forward Spillovers from Organized sector	-0.3024*** (0.1083)	0.0028* (0.0015)	0.2460 (0.3617)
<i>Other-sector Productivity Spillovers</i>			
Average TFP of Horizontal-linked Organized Plants	0.0725 (0.0601)	0.0922+ (0.0604)	0.0861++ (0.0611)
Average TFP of Backward-linked Organized Plants	0.3967*** (0.1356)	0.4802*** (0.1377)	0.6593*** (0.1516)
Average TFP of Forward-linked Organized Plants	0.6814*** (0.1553)	0.5305*** (0.1583)	0.5327*** (0.1539)
<i>Own-sector Employment Spillovers</i>			
Forward Employment Spillovers from Unorganized Sector	0.2373 (0.3046)	0.0170 (0.3834)	0.2987 (0.3270)
Backward Employment Spillovers from Unorganized Sector	1.0265*** (0.1637)	0.9559*** (0.2110)	0.9489*** (0.1595)
Reform*Backward Spillovers from Unorganized sector	0.1194* (0.0700)	0.0012 (0.0011)	0.1245 (0.1179)
Reform*Forward Spillovers from Unorganized sector	0.4080*** (0.0952)	-0.0029** (0.0014)	0.0096 (0.2631)
Constant	-31.4778*** (5.3179)	-25.7196*** (5.6820)	-32.3953*** (5.4840)
Observations	5888	5888	5888
R-squared	0.1676	0.1645	0.1513

*Note: All specifications contain panel (state-industry) fixed effects as well as year fixed effects. All specifications also include state-year fixed effects. Standard errors are clustered by the state-industry level. Significance at the 20% level is indicated by ++, at the 15% level by +, at the 10% level by *, at the 5% level by ** and at the 1% level by ***.*

Appendix Table I. 4: Effect of Reforms on Unorganized Sector Log (Real Output)

	(1) De-licensing	(2) Trade Liberalization	(3) FDI Liberalization
<i>Other-sector Output Spillovers</i>			
Horizontal Output Spillovers from Organized Sector	0.2433*** (0.0338)	0.2295*** (0.0263)	0.0722*** (0.0094)
Backward Output Spillovers from Organized Sector	1.1067** (0.5242)	3.3029*** (0.5535)	1.2749*** (0.1888)
Forward Output Spillovers from Organized Sector	2.2269*** (0.7296)	1.8672** (0.8313)	0.4256+ (0.2907)
Reforms	-35.1456*** (7.8722)	0.0163 (0.0938)	-20.2495*** (5.0166)
Reform*Horizontal Spillovers from Organized sector	-0.1364*** (0.0311)	0.0018*** (0.0003)	-0.0160 (0.0132)
Reform*Backward Spillovers from Organized sector	1.3535*** (0.3229)	0.0046 (0.0038)	0.1788 (0.1623)
Reform*Forward Spillovers from Organized sector	-1.1322*** (0.3194)	0.0003 (0.0044)	0.4035++ (0.2911)
<i>Other-sector Productivity Spillovers</i>			
Average TFP of Horizontal-linked Organized Plants	0.1156 (0.1538)	0.1276 (0.1561)	0.0659 (0.0623)
Average TFP of Backward-linked Organized Plants	0.2777 (0.3441)	0.6205* (0.3437)	0.4485*** (0.1400)
Average TFP of Forward-linked Organized Plants	1.3048*** (0.3868)	1.0213** (0.3989)	0.4978*** (0.1606)
<i>Own-sector Output Spillovers</i>			
Forward Output Spillovers from Unorganized Sector	-0.5289++ (0.3695)	0.0910 (0.4724)	-0.0596 (0.1290)
Backward Output Spillovers from Unorganized Sector	0.7383** (0.2947)	-0.0171 (0.3036)	0.2540*** (0.0891)
Reform*Backward Spillovers from Unorganized sector	-0.3448++ (0.2467)	-0.0068** (0.0030)	-0.0473 (0.1330)
Reform*Forward Spillovers from Unorganized sector	1.9076*** (0.2957)	-0.0008 (0.0038)	0.3408++ (0.2462)
Constant	-82.1772*** (17.4894)	-123.1047*** (17.6378)	-44.5242*** (7.1572)
Observations	5888	5888	5888
R-squared	0.1512	0.1406	0.1489

*Note: All specifications contain panel (state-industry) fixed effects as well as year fixed effects. All specifications also include state-year fixed effects. Standard errors are clustered by the state-industry level. Significance at the 20% level is indicated by ++, at the 15% level by +, at the 10% level by *, at the 5% level by ** and at the 1% level by ***.*

Appendix Table I. 5: Organized Sector Log (Employment) and Log (Output) - Differential Effect of Labor-Intensity and Skill-Intensity

	(1)	(2)	(3)	(4)
	Labor-Intensive Industries	Skill-Intensive Industries	Labor-Intensive Industries	Skill-Intensive Industries
	Employment Spillovers		Output Spillovers	
<i>Other-sector Spillovers</i>				
Horizontal Spillovers from Unorganized sector	0.0941*** (0.0160)	0.1081*** (0.0185)	0.0652*** (0.0199)	0.1108*** (0.0249)
Above Median * Horizontal Spillovers from Unorganized Sector	0.1616*** (0.0200)	0.1454*** (0.0187)	0.1914*** (0.0242)	0.1371*** (0.0208)
Forward Spillovers from Unorganized sector	0.2308 (0.2014)	0.2089 (0.1837)	0.8852*** (0.3123)	0.3576 (0.3127)
Above Median * Forward Spillovers from Unorganized Sector	(0.0274) (0.1876)	0.0441 (0.1870)	0.2201 (0.3179)	0.7574** (0.3500)
Backward Spillovers from Unorganized sector	0.6971*** (0.1273)	0.4723*** (0.1174)	(0.0781) (0.2433)	0.4795+ (0.3202)
Above Median * Backward Spillovers from Unorganized Sector	0.5883*** (0.1138)	0.2941** (0.1304)	(0.0849) (0.2449)	-0.3364++ (0.2522)
<i>Own-sector Spillovers</i>				
Forward Spillovers from Organized Sector	1.3044*** (0.2835)	1.3650*** (0.2707)	3.0121*** (0.8611)	3.1780*** (0.7947)
Above Median * Forward Spillovers from Organized Sector	1.3523*** (0.2833)	1.4351*** (0.2825)	3.1535*** (0.7992)	2.6335*** (0.8949)
Backward Spillovers from Organized Sector	1.0748*** (0.1528)	1.1959*** (0.1590)	0.9981** (0.4541)	1.1708** (0.4907)
Above Median * Backward Spillovers from Organized Sector	1.4036*** (0.1641)	1.4991*** (0.2131)	1.4282*** (0.4640)	2.1296*** (0.5250)
<i>Other-sector Productivity Spillovers</i>				
Average TFP of Horizontal-linked Unorganized Plants	0.0187 (0.0435)	0.0173 (0.0434)	0.1155 (0.1170)	0.1179 (0.1190)
Average TFP of Forward-linked Unorganized Plants	0.0720 (0.1315)	(0.0085) (0.1325)	(0.0249) (0.4143)	(0.2333) (0.4188)
Average TFP of Backward-linked Unorganized Plants	0.1960** (0.0929)	0.1524* (0.0914)	0.9494*** (0.2764)	0.8735*** (0.2776)
Constant	-32.5822*** (4.4249)	-31.2996*** (4.4093)	-101.3892*** (19.5937)	-110.1288*** (20.2183)
Observations	5888	5888	5888	5888
R-squared	0.1891	0.1854	0.1475	0.1414

*Note: All specifications contain panel (state-industry) fixed effects as well as year fixed effects. All specifications also include state-year fixed effects. Standard errors are clustered by the state-industry level. Significance at the 20% level is indicated by ++, at the 15% level by +, at the 10% level by *, at the 5% level by ** and at the 1% level by ***.*

Appendix Table I. 6: Unorganized Sector Log (Employment) and Log (Output) - Differential Effect of Labor-Intensity and Skill-Intensity

	(1) Labor-Intensive Industries Employment Spillovers	(2) Skill-Intensive Industries Employment Spillovers	(3) Labor-Intensive Industries Output Spillovers	(4) Skill-Intensive Industries Output Spillovers
<i>Other-sector Spillovers</i>				
Horizontal Spillovers from Organized Sector	0.1769*** (0.0275)	0.1434*** (0.0272)	0.1008*** (0.0236)	0.0996*** (0.0241)
Above Median * Horizontal spillovers from Organized Sector	0.2416*** (0.0325)	0.2706*** (0.0344)	0.1897*** (0.0247)	0.1906*** (0.0263)
Backward Spillovers from Organized Sector	1.4551*** (0.1771)	1.4631*** (0.1608)	2.8403*** (0.4755)	2.5363*** (0.4812)
Above Median * Backward spillovers from Organized Sector	1.4108*** (0.1839)	1.6084*** (0.2327)	1.9300*** (0.4856)	2.6851*** (0.5452)
Forward Spillovers from Organized Sector	-0.4225++ (0.3076)	0.0313 (0.2748)	0.8438 (0.7931)	2.0268*** (0.7227)
Above Median * Forward spillovers from Organized Sector	0.4629* (0.2721)	0.2746 (0.2757)	2.6550*** (0.7437)	2.1767*** (0.8241)
<i>Own-sector Spillovers</i>				
Forward Spillovers from Unorganized Sector	1.0197*** (0.3291)	0.4043++ (0.3034)	1.1842*** (0.3701)	0.1095 (0.3059)
Above Median * Forward spillovers from Unorganized Sector	0.0980 (0.3263)	0.3180 (0.3162)	-0.5905* (0.3468)	0.3331 (0.4116)
Backward Spillovers from Unorganized Sector	0.9400*** (0.1783)	1.0007*** (0.1638)	0.1152 (0.2496)	0.9684*** (0.3064)
Above Median * Backward spillovers from Unorganized Sector	1.0372*** (0.1567)	0.6859*** (0.1840)	0.8501*** (0.2574)	0.3668++ (0.2662)
<i>Other-sector Productivity Spillovers</i>				
Average TFP of Horizontal-linked Organized Plants	0.0876++ (0.0610)	0.0765 (0.0599)	0.1166 (0.1549)	0.0833 (0.1548)
Average TFP of Backward-linked Organized Plants	0.6104*** (0.1441)	0.5543*** (0.1384)	0.7161** (0.3485)	0.5153+ (0.3516)
Average TFP of Forward-linked Organized Plants	0.5485*** (0.1477)	0.5218*** (0.1491)	1.2917*** (0.3877)	1.1668*** (0.4058)
Constant	-34.0763*** (5.2618)	-32.4809*** (5.2698)	-113.3159*** (17.1542)	-128.3803*** (17.2434)
Observations	5888	5888	5888	5888
R-squared	0.1569	0.1588	0.1405	0.1358

*Note: All specifications contain panel (state-industry) fixed effects as well as year fixed effects. All specifications also include state-year fixed effects. Standard errors are clustered by the state-industry level. Significance at the 20% level is indicated by ++, at the 15% level by +, at the 10% level by *, at the 5% level by ** and at the 1% level by ***.*

Appendix Table I. 7: Organized Sector Log (Employment) & Log (Output) and Unorganized Non-Household Sector Spillovers

	(1)	(2)	(3)	(4)
	Employment		Real Output	
<i>Other-sector Employment/Output Spillovers</i>				
Horizontal Employment Spillovers from NHH Unorganized Sector	0.1270*** (0.0163)	0.0595*** (0.0144)	0.1177*** (0.0177)	0.0444*** (0.0167)
Forward Employment Spillovers from NHH Unorganized Sector	-0.2163 (0.1754)	2.4785*** (0.8735)	0.1555 (0.2543)	1.1772* (0.7039)
Backward Employment Spillovers from NHH Unorganized Sector	0.3219*** (0.1038)	1.0150** (0.3950)	-0.0136 (0.2030)	0.1350 (0.8035)
<i>Other-sector Productivity Spillovers</i>				
Average TFP of Horizontal-linked NHH Unorganized Plants	0.0182 (0.0530)	-0.0051 (0.0498)	-0.0288 (0.1531)	0.0060 (0.1457)
Average TFP of Forward-linked NHH Unorganized Plants	0.2101+ (0.1384)	0.0318 (0.3344)	0.3660 (0.4527)	0.8341 (0.9486)
Average TFP of Backward-linked NHH Unorganized Plants	0.2241** (0.1011)	0.0250 (0.2016)	1.1084*** (0.2882)	-0.4945 (0.9982)
<i>Own-sector Employment/Output Spillovers</i>				
Forward Employment Spillovers from Organized Sector	1.3281*** (0.2781)	-3.4446*** (1.2338)	2.8177*** (0.8268)	12.3932*** (3.0808)
Backward Employment Spillovers from Organized Sector	1.2409*** (0.1575)	0.6009*** (0.2262)	1.7069*** (0.4811)	0.5187 (2.1252)
Constant	-25.4503*** (4.5183)	-0.4314 (8.1644)	-101.5250*** (20.6930)	-321.5567*** (43.0879)
Observations	5888	5888	5888	5888
R-squared	0.1385	0.3383	0.1047	0.2856

*Note: All specifications contain panel (state-industry) fixed effects as well as year fixed effects. . Columns 2 and 4 include state-year and industry-year fixed effects while Columns 1 and 3 do not. Standard errors are clustered by the state-industry level. Significance at the 20% level is indicated by ++, at the 15% level by +, at the 10% level by *, at the 5% level by ** and at the 1% level by ***. NHH stands for the sub-sample of non-household unorganized plants*

Appendix Table I. 8: Organized Sector Log (Employment) & Log (Output) and Unorganized Household Sector Spillovers

	(1)	(2)	(3)	(4)
	Employment		Real Output	
<i>Other-sector Employment/Output Spillovers</i>				
Horizontal Employment Spillovers from HH Unorganized Sector	0.1176*** (0.0176)	0.0278* (0.0142)	0.0923*** (0.0183)	0.0136 (0.0165)
Forward Employment Spillovers from HH Unorganized Sector	-0.1351 (0.1786)	2.6231*** (0.8784)	-0.1038 (0.3361)	1.2486 (1.4487)
Backward Employment Spillovers from HH Unorganized Sector	0.5319*** (0.1454)	1.0595*** (0.3767)	-0.5947* (0.3380)	0.3273 (1.0033)
<i>Other-sector Productivity Spillovers</i>				
Average TFP of Horizontal-linked HH Unorganized Plants	-0.0119 (0.0717)	0.0094 (0.0688)	0.1908 (0.2242)	0.2104 (0.2201)
Average TFP of Forward-linked HH Unorganized Plants	-0.1392 (0.1831)	0.1837 (0.8283)	-0.3507 (0.5559)	1.9189 (2.5368)
Average TFP of Backward-linked HH Unorganized Plants	0.0895 (0.1247)	-2.6008*** (0.5928)	0.6370+ (0.3890)	-6.4893*** (2.2855)
<i>Own-sector Employment/Output Spillovers</i>				
Forward Employment Spillovers from Organized Sector	1.6742*** (0.2889)	1.2021* (0.6488)	4.0599*** (0.7956)	1.0867 (1.5263)
Backward Employment Spillovers from Organized Sector	1.3647*** (0.1673)	1.2371*** (0.2380)	1.7996*** (0.4986)	2.0410++ (1.5262)
Constant	-32.4282*** (4.4233)	-55.8741*** (15.4678)	-112.3751*** (19.6836)	-79.4029+ (48.4015)
Observations	5888	5888	5888	5888
R-squared	0.1258	0.3353	0.0918	0.2843

*Note: All specifications contain panel (state-industry) fixed effects as well as year fixed effects. Columns 2 and 4 include state-year and industry-year fixed effects while Columns 1 and 3 do not. Standard errors are clustered by the state-industry level. Significance at the 20% level is indicated by ++, at the 15% level by +, at the 10% level by *, at the 5% level by ** and at the 1% level by ***. HH stands for the sub-sample of household-based unorganized plants.*

Appendix Table I. 9: Non-household Unorganized Sector Log (Employment) & Log (Real Output)

	(1)	(2)	(3)	(4)
	Employment		Real Output	
<i>Other-sector Employment/Output Spillovers</i>				
Horizontal Employment Spillovers from Organized Sector	0.2106*** (0.0265)	0.1002*** (0.0239)	0.1569*** (0.0215)	0.0590*** (0.0206)
Forward Employment Spillovers from Organized Sector	0.0721 (0.2504)	-1.4315*** (0.5540)	2.2393*** (0.7828)	-14.4009*** (2.7383)
Backward Employment Spillovers from Organized Sector	1.0159*** (0.1550)	-0.4545++ (0.3390)	1.6015*** (0.4920)	11.1751*** (2.0298)
<i>Other-sector Productivity Spillovers</i>				
Average TFP of Horizontal-linked Organized Plants	0.0434 (0.0636)	0.0600 (0.0602)	0.0852 (0.1713)	0.0789 (0.1647)
Average TFP of Forward-linked Organized Plants	0.3071** (0.1396)	-0.5767** (0.2587)	0.8938** (0.3962)	3.8656*** (1.0933)
Average TFP of Backward-linked Organized Plants	0.3719*** (0.1343)	-0.6056 (0.5388)	-0.0448 (0.3639)	4.2301*** (1.1117)
<i>Own-sector Employment/Output Spillovers</i>				
Forward Employment Spillovers from Unorganized Sector	0.2158 (0.2210)	0.5178 (0.6204)	0.2369 (0.2916)	0.4264 (1.0942)
Backward Employment Spillovers from Unorganized Sector	0.9580*** (0.1457)	0.5703++ (0.4370)	0.8018*** (0.2255)	-1.2360* (0.6309)
Constant	-23.8416*** (4.0094)	16.9023* (10.0000)	-108.4850*** (17.6922)	73.2393* (40.4991)
Observations	5888	5888	5888	5888
R-squared	0.1151	0.2938	0.0854	0.2513

*Note: All specifications contain panel (state-industry) fixed effects as well as year fixed effects. Columns 2 and 4 include state-year and industry-year fixed effects while Columns 1 and 3 do not. Standard errors are clustered by the state-industry level. Significance at the 20% level is indicated by ++, at the 15% level by +, at the 10% level by *, at the 5% level by ** and at the 1% level by ***.*

Appendix Table I. 10: Household Unorganized Sector Log (Employment) & Log (Real Output)

	(1)	(2)	(3)	(4)
	Employment		Real Output	
Other-sector Employment/Output Spillovers				
Horizontal Employment Spillovers from Organized Sector	0.1771*** (0.0262)	0.0459** (0.0211)	0.1105*** (0.0180)	0.0257+ (0.0161)
Forward Employment Spillovers from Organized Sector	-0.0734 (0.2776)	0.0066 (0.6825)	1.2810* (0.6636)	-5.9704*** (1.6519)
Backward Employment Spillovers from Organized Sector	1.0791*** (0.1661)	-0.0036 (0.2474)	3.1033*** (0.4280)	7.4222*** (1.3464)
Other-sector Productivity Spillovers				
Average TFP of Horizontal-linked Organized Plants	0.1456** (0.0641)	0.1678*** (0.0582)	0.2619+ (0.1603)	0.3532** (0.1502)
Average TFP of Forward-linked Organized Plants	0.1996++ (0.1547)	2.3229*** (0.4539)	0.2721 (0.3466)	3.2706*** (0.8430)
Average TFP of Backward-linked Organized Plants	0.7042*** (0.1382)	0.3905 (0.3380)	0.9785*** (0.3130)	0.3618 (0.8386)
Own-sector Employment/Output Spillovers				
Forward Employment Spillovers from Unorganized Sector	0.1087 (0.3109)	1.6486** (0.7999)	-0.6660* (0.3632)	0.1358 (0.3935)
Backward Employment Spillovers from Unorganized Sector	0.0701 (0.1740)	0.7582* (0.4470)	0.6306* (0.3664)	-0.7973 (1.1374)
Constant	-13.5806** (5.3486)	-33.5410*** (9.1676)	-101.4007*** (17.2523)	-25.7192 (34.3912)
Observations	5888	5888	5888	5888
R-squared	0.0635	0.2893	0.0507	0.2270

*Note: All specifications contain panel (state-industry) fixed effects as well as year fixed effects. Columns 2 and 4 include state-year and industry-year fixed effects while Columns 1 and 3 do not. Standard errors are clustered by the state-industry level. Significance at the 20% level is indicated by ++, at the 15% level by +, at the 10% level by *, at the 5% level by ** and at the 1% level by ***.*

Appendix Table I. 11: Unorganized Sector Log (Employment) and Spillovers from Small, Medium-sized, and Large Organized Plants

	(1)	(2)	(3)	(4)	(5)	(6)
	Small Organized Plants		Medium-sized		Large Organized Plants	
<i>Other-sector Employment Spillovers</i>						
Horizontal Employment Spillovers from Organized Sector	0.2766*** (0.0390)	0.1315*** (0.0347)	0.1349*** (0.0338)	0.0307 (0.0282)	0.1353*** (0.0301)	0.0558** (0.0257)
Forward Employment Spillovers from Organized Sector	0.1865 (0.2799)	-2.4068*** (0.9256)	0.6144** (0.2478)	3.1810*** (0.5240)	0.0422 (0.2707)	-0.1135 (0.5850)
Backward Employment Spillovers from Organized Sector	3.7769*** (0.3652)	1.7919** (0.8805)	1.8564*** (0.2231)	1.1810*** (0.3847)	0.8154*** (0.1359)	0.4686+ (0.3231)
<i>Other-sector Productivity Spillovers</i>						
Average TFP of Horizontal-linked Organized Plants	0.0177 (0.1226)	0.0583 (0.1116)	-0.2350 (0.2109)	0.0048 (0.1815)	-0.2827++ (0.2177)	-0.0514 (0.1952)
Average TFP of Forward-linked Organized Plants	0.1316++ (0.1005)	1.4909*** (0.3949)	0.0552 (0.1428)	1.2862*** (0.1675)	0.4307*** (0.1368)	-0.8627** (0.3720)
Average TFP of Backward-linked Organized Plants	-0.0955 (0.0750)	-1.0399*** (0.2836)	1.2728*** (0.2062)	5.7880*** (0.5210)	0.9936*** (0.1668)	-0.0168 (0.4664)
<i>Own-sector Employment Spillovers</i>						
Forward Employment Spillovers from Unorganized Sector	0.4671+ (0.3042)	4.3433*** (0.7311)	0.2256 (0.3335)	-6.1909*** (0.8849)	0.0700 (0.3486)	-1.2611+ (0.8698)
Backward Employment Spillovers from Unorganized Sector	0.6097*** (0.1537)	1.4194*** (0.4551)	0.7627*** (0.1508)	2.8699*** (0.8558)	0.9405*** (0.1631)	1.4336*** (0.4425)
Constant	-45.0019*** (5.0184)	-57.7580*** (10.9365)	- (4.8031)	-14.6686++ (10.2193)	-19.9992*** (5.7759)	1.1868 (10.9272)
Observations	5888	5888	5888	5888	5888	5888
R-squared	0.1354	0.3506	0.0952	0.3459	0.0784	0.3472

*Note: The independent variables are constructed using the total employment by large organized plants in a state-industry cell. Small plants are defined as those with less than 50 employees, medium-sized plants have 51-150 employees and large plants are defined as those with more than 151 employees. All specifications contain panel (state-industry) fixed effects as well as year fixed effects. Columns 2, 4 and 6 contains state-year and industry-year fixed effects. Standard errors are clustered by the state-industry level. Significance at the 20% level is indicated by ++, at the 15% level by +, at the 10% level by *, at the 5% level by ** and at the 1% level by ***.*

Appendix Table I. 12: Unorganized Sector Log (Real Output) and Spillovers from Small, Medium-sized and Large Organized Plants

	(1)	(2)	(3)	(4)	(5)	(6)
	Small Organized Plants		Medium-sized Organized		Large Organized Plants	
<i>Other-sector Employment Spillovers</i>						
Horizontal Output Spillovers from Organized Sector	0.1568*** (0.0259)	0.0424* (0.0236)	0.0727*** (0.0270)	0.0097 (0.0249)	0.0987*** (0.0259)	0.0372+ (0.0237)
Forward Output Spillovers from Organized Sector	3.3850*** (0.7063)	8.4633*** (2.0031)	2.1312*** (0.6363)	-2.8665* (1.7243)	1.8507*** (0.6872)	-14.5856*** (2.6380)
Backward Output Spillovers from Organized Sector	1.8990*** (0.4786)	3.2306** (1.6102)	0.0714 (0.4036)	3.2105** (1.4476)	1.8622*** (0.4192)	3.7642*** (1.0150)
<i>Other-sector Productivity Spillovers</i>						
Average TFP of Horizontal-linked Organized Plants	0.1471 (0.2949)	0.4016++ (0.2848)	-0.1178 (0.5463)	0.2467 (0.4880)	-0.6872 (0.5404)	-0.1820 (0.5008)
Average TFP of Forward-linked Organized Plants	0.3647++ (0.2671)	4.5774*** (0.9363)	-0.0404 (0.3574)	0.0196 (0.7767)	-0.1140 (0.3610)	-0.7285 (0.8826)
Average TFP of Backward-linked Organized Plants	-0.2302 (0.2111)	2.4251** (1.0978)	2.9122*** (0.5747)	0.4555 (1.8816)	1.6150*** (0.4211)	6.4698*** (1.1590)
<i>Own-sector Employment Spillovers</i>						
Forward Output Spillovers from Unorganized Sector	0.5705** (0.2904)	-4.1584*** (0.8735)	0.8264*** (0.2774)	-0.2879 (0.6469)	0.6361** (0.3235)	4.2946*** (1.3761)
Backward Output Spillovers from Unorganized Sector	0.6202*** (0.2218)	-1.6978* (0.9338)	0.8557*** (0.2374)	-1.4178+ (0.9057)	0.6451*** (0.2238)	-1.9320*** (0.5792)
Constant	-131.1744*** (16.0006)	- (27.2294)	-80.3811*** (14.9490)	40.4008 (39.3116)	-107.6278*** (18.0683)	203.2785*** (43.4291)
Observations	5888	5888	5888	5888	5888	5888
R-squared	0.0802	0.2834	0.0552	0.2814	0.0644	0.2820

*Note: The independent variables are constructed using the total employment by large organized plants in a state-industry cell. Small plants are defined as those with less than 50 employees, medium-sized plants have 51-150 employees and large plants are defined as those with more than 151 employees. All specifications contain panel (state-industry) fixed effects as well as year fixed effects. Columns 2, 4 and 6 contains state-year and industry-year fixed effects. Standard errors are clustered by the state-industry level. Significance at the 20% level is indicated by ++, at the 15% level by +, at the 10% level by *, at the 5% level by ** and at the 1% level by ***.*

Appendix Table I. 13: Organized Sector Log (Employment) of Small, Medium-sized and Large Plants

	(1)	(2)	(3)	(4)	(5)	(6)
	Small Organized Plants		Medium-sized Organized		Large Organized Plants	
<i>Other-sector Employment Spillovers</i>						
Horizontal Employment Spillovers from Unorganized Sector	0.1189*** (0.0140)	0.0565*** (0.0123)	0.0833*** (0.0176)	0.0287* (0.0169)	0.1028*** (0.0192)	0.0594*** (0.0191)
Forward Employment Spillovers from Unorganized Sector	-0.0539 (0.1500)	0.2559 (0.4258)	0.2663++ (0.2031)	0.8187+ (0.5672)	0.1909 (0.2257)	1.6859*** (0.6285)
Backward Employment Spillovers from Unorganized Sector	0.3262*** (0.0926)	-1.2318*** (0.4320)	0.4813*** (0.1302)	-0.5764 (0.6365)	0.3081** (0.1411)	1.1280+ (0.7467)
<i>Other-sector Productivity Spillovers</i>						
Average TFP of Horizontal-linked Unorganized Plants	0.0482+ (0.0333)	0.0420++ (0.0319)	0.0370 (0.0565)	0.0054 (0.0571)	0.0288 (0.0635)	-0.0054 (0.0621)
Average TFP of Backward-linked Unorganized Plants	0.0612 (0.0679)	0.2782 (0.3545)	-0.0049 (0.1104)	0.4300 (0.5051)	0.0346 (0.1223)	-0.9826* (0.5505)
Average TFP of Forward-linked Unorganized Plants	-0.1025 (0.1005)	0.6258** (0.3061)	-0.0235 (0.1459)	0.5412 (0.5202)	-0.0888 (0.1592)	1.5090*** (0.5051)
<i>Own-sector Employment Spillovers</i>						
Forward Employment Spillovers from Organized Sector	1.3223*** (0.1980)	1.4528** (0.5832)	1.1988*** (0.2571)	0.9818 (0.7712)	1.1194*** (0.3318)	-3.0681*** (0.8613)
Backward Employment Spillovers from Organized Sector	0.7021*** (0.1043)	-0.2855 (0.3352)	1.0177*** (0.1559)	0.3201 (0.6101)	1.5039*** (0.1975)	1.7375*** (0.5842)
Constant	-21.5475*** (3.3318)	-0.0616 (9.3018)	-29.5700*** (4.2033)	-15.9440 (13.8352)	-30.9233*** (5.2646)	-16.5117 (14.2225)
Observations	5888	5888	5888	5888	5888	5888
R-squared	0.1111	0.2859	0.0555	0.1845	0.0626	0.1965

*Note: The dependent variables are constructed using the total employment by organized plants in a state-industry cell. Small plants are defined as those with less than 50 employees, medium-sized plants have 51-150 employees and large plants are defined as those with more than 151 employees. All specifications contain panel (state-industry) fixed effects as well as year fixed effects. Columns 2, 4 and 6 contains state-year and industry-year fixed effects. Standard errors are clustered by the state-industry level. Significance at the 20% level is indicated by ++, at the 15% level by +, at the 10% level by *, at the 5% level by ** and at the 1% level by ***.*

Appendix Table I. 14: Organized Sector Log (Real Output) of Small, Medium-sized and Large Plants

	(1)	(2)	(3)	(4)	(5)	(6)
	Small Organized Plants		Medium-sized Organized		Large Organized Plants	
<i>Other-sector Employment Spillovers</i>						
Horizontal Output Spillovers from Unorganized Sector	0.1240*** (0.0178)	0.0502*** (0.0166)	0.0876*** (0.0220)	0.0288++ (0.0216)	0.0931*** (0.0207)	0.0445** (0.0207)
Forward Output Spillovers from Unorganized Sector	0.2881 (0.2687)	-2.0992++ (1.4854)	0.8798** (0.3514)	-1.4907 (1.6106)	-0.3317 (0.3783)	3.4666** (1.4285)
Backward Output Spillovers from Unorganized Sector	-0.1073 (0.1999)	-1.2351* (0.7437)	-0.4614* (0.2362)	-1.0559+ (0.7263)	-0.2407 (0.2533)	-0.3563 (0.8015)
<i>Other-sector Productivity Spillovers</i>						
Average TFP of Horizontal-linked Unorganized Plants	0.2006* (0.1138)	0.1719+ (0.1143)	0.0552 (0.1821)	-0.1059 (0.1878)	0.0677 (0.1784)	-0.0786 (0.1763)
Average TFP of Backward-linked Unorganized Plants	0.8635*** (0.2598)	1.9586*** (0.6389)	0.2653 (0.3584)	0.8576 (0.7742)	0.5693+ (0.3509)	-0.2585 (0.8280)
Average TFP of Forward-linked Unorganized Plants	-0.4941 (0.3999)	-2.0036 (1.5956)	-0.1491 (0.4917)	0.7540 (1.8889)	-0.2016 (0.4738)	-4.5119** (1.7790)
<i>Own-sector Employment Spillovers</i>						
Forward Output Spillovers from Organized Sector	2.6764*** (0.7685)	16.0094*** (2.9738)	2.0100** (0.9160)	12.6001*** (3.3854)	3.7832*** (1.0057)	8.7808*** (2.3892)
Backward Output Spillovers from Organized Sector	1.1532*** (0.4409)	2.6564+ (1.7085)	1.1018** (0.5206)	1.4958 (1.6860)	1.7622*** (0.5631)	1.5102 (2.0008)
Constant	-85.3306*** (18.1552)	-361.7262*** (57.2583)	-74.0800*** (19.3961)	-275.3983*** (65.0484)	-112.3907*** (22.5967)	-284.3498*** (61.3908)
Observations	5888	5888	5888	5888	5888	5888
R-squared	0.0717	0.2265	0.0289	0.1555	0.0367	0.1672

*Note: The dependent variables are constructed using the total employment by organized plants in a state-industry cell. Small plants are defined as those with less than 50 employees, medium-sized plants have 51-150 employees and large plants are defined as those with more than 151 employees. All specifications contain panel (state-industry) fixed effects as well as year fixed effects. Columns 2, 4 and 6 contains state-year and industry-year fixed effects. Standard errors are clustered by the state-industry level. Significance at the 20% level is indicated by ++, at the 15% level by +, at the 10% level by *, at the 5% level by ** and at the 1% level by ***.*