Place based policies and informal firms

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Abstract: This paper studies the impact of a federally financed location-based tax incentive scheme on informal firms in India. Using a difference-in-differences approach with bordering districts, neighboring states, and major states as control groups, I find no evidence for increases in employment, total output, gross value added, and registration status for informal firms on average. However, separating informal firms into those that do not hire regular workers (Own Account Manufacturing Enterprises) and those that hire workers (Non-directory manufacturing enterprises/Directory Manufacturing Enterprises) reveals heterogeneous effects. I find that the policy change led to a higher likelihood of registration by NDME/DMEs but no effect on OAMEs. The policy change, however, did not impact the size of these different kinds of firms.

I Introduction

Place-based policies are used by governments to address regional economic imbalances by providing tax exemptions and other benefits to firms to locate to economically lagging regions. Some examples of these policies include the Empowerment Zones, Enterprise Zones and Promise Zones in the United States, Regional Selective Assistance in the United Kingdom, and ZFU (*"Zones Franches Urbaines"*) in France. Despite their popularity with policy makers, economists criticize place-based policies on the grounds that they mainly move economic activity from one location to another without increasing aggregate output.[1] Moreover, in the spatial-equilibrium framework commonly used to model place-based policies (Roback (1982), Moretti (2011), Kline and Moretti (2013)), whether the welfare gains from the policy accrue to workers or landowners in the particular locality largely depends on the mobility of workers and the elasticity of housing supply. Notwithstanding the theoretical arguments, the effectiveness of place-based policies remains an empirical question.

Most of the previous empirical work evaluating location-based policies has focused on the United States and Europe, and its effects in developing countries have remained largely understudied. Furthermore, the focus on developed countries has meant that the important question of how place-based policies affect informal sector firms has not been explored. Although most place-based policies impact formal firms, there can be important effects on the informal sector. On the one hand, if informal firms expect larger benefits from formalizing after a tax exemption scheme, the policy might lead to a decline in

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[1]Theoretical arguments can be found in Glaeser (2001), Glaeser and Gottlieb (2008), Moretti (2011), Kline and Moretti (2013), and Gaubert (2014).

informality. On the other hand, many informal firms source goods and services to formal firms and we might find an increase in both informal and formal firms as a result of the place-based policy. Moreover, a major reason why informal firms do not register in the formal sector is to avoid paying taxes. Hence a tax exemption scheme might incentivize informal firms to register to become formal. Given the amount of tax revenues lost by governments due to firms remaining informal, any incentive scheme that induces informal firms to register is of great policy importance.

To study these important empirical questions, I look at the impact of a place-based policy in India on informal firms. More specifically, I analyze the New Industrial Policy for the states of Uttarakhand and Himachal Pradesh. As part of the policy, the federal government provided tax exemptions and capital subsidies to formal firms (both new and existing) starting in 2003.

To the best of my knowledge, no other policy affected industrial firms in the states of Uttarakhand and Himachal Pradesh differentially more or less than other states, beginning 2003, and this helps me identify the causal effect of the policy change using a difference-in-differences (DID) methodology. I use two rounds of the informal sector surveys to look at the changes in informal firms (on average) in the treated regions (Uttarakhand and Himachal Pradesh) compared to control regions, before and after the policy change. To form valid counterfactuals for the treated units, I use three control groups. The strictest empirical specification compares informal firms in the bordering districts in the treated states to bordering districts in the control states. Then, I compare informal firms in the treated states to informal firms in neighboring control states and finally, to all major states taken together as a control group.

I find no statistically significant difference in average employment, gross value added, total output, and the proportion of formal registrations among

informal firms in the treated regions as compared to control regions, before and after the policy change. In fact, on average, informal firms in the treated regions were more likely to self report to have contracted in size as compared to firms in control regions as a result of the policy change. Despite the null results on average, I find substantial heterogeneity by firm type in terms of registration by informal firms. I find that Directory Manufacturing Establishments (DMEs) and Non-directory Manufacturing Establishments (NDMEs)[2] in the treated regions showed a differentially higher likelihood to register as compared to the control regions because of the policy change. However, Own Account Manufacturing Establishments (OAMEs)[3] in the treated states do not exhibit differential response in terms of registration as compared to the control regions. These results suggest that the tax exemption scheme incentivized informal firms that hire workers to register but had no effect on smaller informal firms which do not hire workers.

This paper is closely related to the literature on business registration decisions of informal firms. For example, de Andrade, Bruhn, and McKenzie (2013) find that enforcement visits by a municipal inspector led to more formal registrations by informal firms in Brazil, whereas information and free registration costs had no effect.[4] Bruhn (2011) finds that a Mexican regulation that simplified business entry regulation led to former wage earners opening new businesses but did not induce former unregistered businesses to register. To explain why the Mexican regulation (used in Bruhn (2011)) did not induce former unregistered informal firms to register, Bruhn (2013) sepa-

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[2]DMEs employ a total of six or more hired workers while NDMEs employ one to five hired workers.

[3]These are establishments not hiring any hired worker.

[4]De Giorgi and Rahman (2013) also find that providing information had no impact on actual registration for informal firms in Bangladesh.

rates informal business owners into those that are similar to wage workers and those that are similar to formal business owners. Bruhn (2013) finds that the policy did not induce the wage worker informal firm category to register but led to more registrations by the formal business owner category in regions that had constraints to entrepreneurship before the policy change.[5] The results in my paper are similar as I find that the tax exemption scheme induced more registrations for firms that hire workers (that are more likely to resemble formal firms) and no effect on own account enterprises (that are more likely to resemble wage workers).

This paper also adds to the growing empirical literature evaluating place-based policies, most of which has focused on the United States (Neumark and Kolko (2010), Greenbaum and Engberg (2004), Bondonio and Greenbaum (2007) Ham, Swenson, Imrohoroglu, and Song (2011), and Busso, Gregory, and Kline (2013) among others) and European countries such as United Kingdom (Criscuolo, Martin, Overman, and van Reenen (2012)), France (Mayer, Mayneris, and Py (2012), Givord, Rathelot, and Sillard (2013)) and Italy (Bronzini and de Blasio (2006)). A few recent papers have also studied place-based policies in the context of developing countries such as China (Wang (2013)) and India (Chaurey (2014)). However, all these papers evaluate the effects on formal sector firms and the local population. My paper makes a significant contribution to the existing literature by studying the effects of a place-based policy on informal firms.

The results of this paper therefore provide suggestive evidence that location-based tax exemptions might be another tool for policy makers to

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[5]Many other papers have argued that informal sector employment is a mix of firms that are similar to wage workers and those that are closer to small formal firms - see for example, de Mel, McKenzie, and Woodruff (2010) and Gunther and Launov (2012).

incentivize informal firms to register and bring them under the ambit of formal taxation.

The rest of the paper is organized as follows. The next section presents the details of the policy. Section III discusses the empirical strategy, Section IV describes the data, and the results are discussed in Section V. Finally, Section VI concludes.

II New Industrial Policy for Uttarakhand and Himachal Pradesh

The New Industrial Policy for Uttarakhand and Himachal Pradesh was designed with a view to industrialize the two states located in the northern part of India.[6] The two states share international borders with China and Nepal, and cover under 4% of India's total area, two-thirds of which is under forest cover and mountainous terrain. The industrial base in the two states also started at a very low level and in 2000, they only accounted for 1% of the industrial output in India. Due to their hilly terrain and international borders, these two states were in the list of "special category states" that received preferential fiscal benefits from the federal government.

As part of the New Industrial Policy, starting 2003, the Government of India (federal government) decided to provide 100% excise duty exemption for 10 years and 100% income tax exemption for 5 years, for *new* industrial units. The same benefits were extended to *existing* industrial units if they expanded their fixed capital investment by 25%. In addition, all firms were eligible for a capital investment subsidy equaling 15% of their investment in plant and ma-

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[6]See figure 1.

6

chinery up to Rs.3,000,000. The excise tax exemption remained operational until 31st March 2010 and the income tax exemption remained operational until 31st March 2012.

III   Empirical Strategy

The main focus of this paper is to empirically test whether the New Industrial Policy led to differential responses by informal firms in the treated regions as compared to the control regions. The policy change affected formal firms in Uttarakhand and Himachal Pradesh beginning 2003, and this state-year variation can be used in a differences-in-differences (DID) specification to estimate the causal effect of the policy change.

Although the policy affected formal firms, there might be a number of reasons to expect that informal firms would respond. First, informal firms are linked to formal firms because they supply goods and services to the formal sector firms and hence the average size of an informal firm may increase as more formal firms enter the treated regions. There might be a decline in the size of the informal sector firms if competition from formal firms forces them out of the market. Finally, in terms of registration with a government agency, a full tax exemption scheme might be a huge incentive to register for informal firms. This is because registration with an agency gives them benefits such as access to government schemes like cheap credit, marketing support, and business training among others without being burdened by taxes.

To test the effects of the policy on informal firms using a DID framework, I use three control groups as counterfactuals for the treated regions. First, I run a bordering districts DID specification, which essentially compares informal firms in the treated states in the districts along the border to those

in the control states in districts along the border, before and after the policy change. Then, I run regression specifications comparing informal firms in the treated states to those in the neighboring control states or all major states taken together, before and after 2003.

I run regressions of the form:

$$y_{isjt} = \alpha_s + \lambda_j + \delta_j + \beta(post_t \times treat_s) + \gamma(X_{isjt}) + \varepsilon_{isjt} \tag{1}$$

where i,s,j,t refer to informal firm, state or district, industry, and year respectively. The coefficient β on the interaction of $post_t$ and $treat_s$ where

$$post_t = \begin{cases} 1 & \text{if year is 2003 or after} \\ 0 & \text{if year is pre 2003} \end{cases}$$

$$treat_s = \begin{cases} 1 & \text{if state is Uttarakhand or Himachal Pradesh} \\ 0 & \text{otherwise (control states)}, \end{cases}$$

is the treatment effect of the policy change. y_{isjt} represents an outcome variable such as employment, output, gross value added or whether the firm is registered by a government agency. The regressions control for year, industry, and district fixed effects. X_{isjt} includes controls for firm specific characteristics such as type of enterprise (OAME, NDME, DME), ownership type (sole proprietorship, partnership, cooperative society etc.), nature of operation (perennial or seasonal), location of the enterprise, source of inputs, whether the firm maintains accounts and whether the firm is urban/rural. All regressions also use the weights provided in the data set.

IV Data

I use two rounds of the National Sample Survey Organization (NSSO) unorganized manufacturing enterprises surveys - Round 56 (2000-01) and Round 62 (2005-06). This gives me information on one round both before and after the policy change in 2003. These surveys are conducted by the Ministry of Statistics and Program Implementation (MoSPI) and cover unorganized enterprises engaged in manufacturing activities. The unorganized manufacturing surveys largely covers those manufacturing units that are not covered under by the Annual Survey of Industries, and geographically covers almost all of India.[7] The surveys elicit information on the ownership structure, registration status, problems faced and assistance received, and other firm level information such as employment, sales, output, inputs, value added etc.

The enterprises in the surveys are categorized as (i) OAME (own account manufacturing enterprises) - those that do not hire regular workers, (ii) NDME (Non-directory manufacturing enterprises) - those that employ one to five hired workers, and (iii) DME (Directory manufacturing enterprises) - employ a total of six or more hired workers.

Table 1 shows some summary statistics for the data. OAMEs on average have less than 2 employees across different groups and years, whereas NDME/DMEs have on average 5 employees. Output, gross value added, and registration status is also lower for OAME than NDME/DMEs.

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[7]Annual Survey of Industries is a survey of large manufacturing plants registered under Sections 2m(i) and 2m(ii) of the Factories Act, 1948.

V   Results

I discuss the results of the regressions using the entire sample (Tables 2 through 7) and then I report the results by restricting the sample to OAME and NDME/DME separately (Tables 8 through 11).

In all the regression results in Tables 2 through 7, columns 1 and 2 use the bordering districts as the control group, followed by neighboring states in columns 3 and 4, and finally all major states in columns 5 and 6.[8] I control for district, 2-digit industry, and year fixed effects in each of the regressions. The district and industry fixed effects control for time invariant district and industry characteristics. I also control for firm-level characteristics such as type of enterprise (OAME, NDME, DME), ownership type (sole proprietorship, partnership, cooperative society etc.), nature of operation (perennial or seasonal), location of the enterprise, source of inputs, whether the firm maintains accounts and whether the firm is urban/rural.

In Table 2, I find no statistically significant effect of the policy change on employment of informal firms in treated regions as compared to control regions, before and after the policy change. This suggests that the policy change had no differential effect on employment in informal firms on average in the treated states as compared to the control states. Similar results are mirrored in the regressions for gross value added (Table 3) and output (Table 4), where I find that the policy change did not lead to any differential effect on the size of the informal firms in treated regions compared to control regions. This is also clear from the kernel density graphs which do not show any change after the policy came into effect (Figures 2, 3, and 4)

In Table 5, I look at the average response of informal firms in terms of

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[8]The control groups are listed in the Appendix.

registering with a government agency in response to the policy change. All firms taken together, I do not find a differential impact of the policy change on firms' registration status. I also do not find a differential effect on the proportion of young firms as a result of the policy change (Table 6). I then look at a self reported measure of whether the firm had contracted in size over the preceding 3 years in Table 7. I find that informal firms are differentially more likely to report that they contracted in size in treated states than the control states after the policy change relative to before the policy change.

Having found no differential effects between informal firms in treated regions compared to control regions (before and after the policy change), I then look at the effects of the policy by separately analyzing OAMEs and NDME/DMEs. The idea is similar in spirit to Bruhn (2013) who divides informal firms in Mexico into two categories - those that resemble wage workers and those that resemble formal firms. In this paper, OAME and NDME/DME provide a similar distinction. In this analysis, I categorize establishments as either OAME (own account establishments) or NDME/DME (establishments hiring workers), and run regressions separately for the two groups. In general, we would expect to find a differential response of the policy on NDME/DMEs but not on OAMEs.

In Table 8, columns 1 through 3, look at the effect of the policy on the likelihood of OAMEs to register. Column 1 uses the bordering districts as the control group, followed by neighboring states (column 2) and all major states in column 3. I find no effect of the policy on the likelihood to register with a government agency for OAMEs. This is consistent with Bruhn (2013) who finds no registration response by informal firms that have similar characteristics to a wage worker. Columns 4 through 6 look at the effect of the policy on NDME/DMEs. In column 4, the control group is bordering districts and I

find that the policy change led to a 13.1% increase in the likelihood of registration for NDME/DMEs in the treated regions relative to the control regions (after the policy change compared to before the policy change). In column 5, I compare informal firms in the treated states to the neighboring control states, and I find a 12.8% increase in the likelihood of registration. Column 6 uses all major states as the control group and I find a 13% differential increase in the likelihood of registration. The coefficient *post*treat* across Columns 4, 5, and 6 are similar in magnitude, providing credibility to the estimates.

I then look whether the policy change led to a differential effect on informal firms in terms of average employment, gross value added, and output for OAMEs and NDME/DMEs separately. In Tables 9, 10, and 11, I find no differential effect of the policy on the employment, gross value added, and output. Taken together, these results suggest that the place-based tax exemption scheme induced NDME/DMEs to register with government agencies, but had no effect on OAMEs. However, the policy had no impact on the average size of the informal firms (employment, gross value added, output) in the treated regions as compared to the control regions.

VI   Conclusion

In this paper, I study the effects of a place-based tax exemption scheme on informal firms, a question that has not been explored in previous literature. I examine the New Industrial Policy for Uttarakhand and Himachal Pradesh, that provided full excise tax and income tax exemption along with a capital subsidy for new and existing firms starting 2003. Although the policy was targeted towards formal firms, it is conceivable that it would have effects on the informal sector.

I find that on average the policy did not lead to an increase in employment, gross value added, and output of informal firms in the treated states compared to the control states. There is some evidence that the informal firms in the treated states were more likely to self report to have contracted in size after the policy relative to before the policy change compared to informal firms in the control states. In terms of registration with a government agency, on average I find no effect of the tax exemption scheme on informal firms. However, looking at own account informal firms and NDME/DMEs separately reveals heterogeneous effects of the policy change on registration likelihood. I find that the tax exemption scheme differentially increased the likelihood of registration for NDME/DMEs (informal firms that hire regular workers) in treated regions compared to control regions, but there was no effect of the policy on OAMEs (informal firms that do not hire workers). The policy did not lead to a differential effect in terms of employment, gross value added, or output for the different kinds of firms.

Taken together, the results suggest that tax exemption schemes can be an incentive for informal firms to register, especially for NDMEs and DMEs. What other policies can induce different kinds of informal firms to register to become formal is an interesting area of future research.

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Table 1: Summary Statistics

Variables	Treated state			Neighboring states			Major states		
	All firms	OAME	NDME/DME	All firms	OAME	NDME/DME	All firms	OAME	NDME/DME
year		2000			2000			2000	
employment	1.70 (1.70)	1.39 (.68)	4.09 (3.85)	2.46 (3.79)	1.74 (.96)	5.31 (7.62)	2.19 (2.58)	1.71 (.89)	5.14 (5.70)
output	125924.50 (1382592)	27453.89 (57164.73)	878130.10 (3981823)	123447.80 (961465)	34244.27 (74479.4)	480542.70 (2107972)	110684.80 (1138396)	34622.63 (74481.54)	576301.50 (2990489)
gross value added	29813.19 (142246.9)	15441.17 (18797.03)	139599.40 (398158.1)	47172.42 (168273.9)	18681.61 (21842.18)	161225.30 (351434.2)	35444.71 (129298.2)	17063.39 (19986.61)	147966.40 (319192.8)
registration	.15 (.36)	.10 (.30)	.51 (.50)	.08 (.27)	.04 (.19)	.24 (.43)	.09 (.30)	.05 (.21)	.39 (.49)
Observations	5352	3607	1745	41256	23619	17637	192480	125696	66784
year		2005			2005			2005	
employment	1.77 (2.01)	1.38 (.75)	3.96 (4.19)	2.31 (2.85)	1.77 (.96)	4.72 (5.77)	2.15 (2.80)	1.63 (.8718626)	5.22 (6.21)
output	142509.40 (1904166)	37633.48 (86018.22)	720400.90 (4815667)	196249.70 (2399249)	44804.21 (146387.4)	873552.90 (5553970)	158035.50 (2007493)	36925.38 (103921)	873235.50 (5212259)
gross value added	51075.89 (861735.4)	18629.52 (23959.44)	229401.8 (2188023)	59003.68 (407735.8)	23524.08 (45824.57)	214897.1 (926150.4)	50001.97 (434603.3)	19079.34 (29226.48)	230869.1 (1118202)
registration	.22 (.42)	.16 (.36)	.59 (.49)	.08 (.26)	.04 (.19)	.24 (.43)	.09 (.29)	.04 (.21)	.38 (.48)
Observations	2063	1343	720	14045	8397	5648	69630	45747	23883

Notes: Mean and standard deviation (in parentheses) for all outcome variables.

17

Table 2: Employment

	(1) log [employment]	(2) log [employment]	(3) log [employment]	(4) log [employment]	(5) log [employment]	(6) log [employment]
post*treat	0.0467	0.0273	0.0439	0.00463	0.0424	0.0175
	(0.0482)	(0.0295)	(0.0396)	(0.0256)	(0.0406)	(0.0238)
Constant	0.951***	0.567***	0.930***	0.457***	1.014***	0.591***
	(0.120)	(0.144)	(0.0428)	(0.0633)	(0.0489)	(0.0460)
Observations	13,484	13,466	62,716	62,607	269,525	269,308
R-squared	0.235	0.589	0.186	0.581	0.181	0.586
district FE	Yes	Yes	Yes	Yes	Yes	Yes
year dummy	Yes	Yes	Yes	Yes	Yes	Yes
2 digit industry FE	Yes	Yes	Yes	Yes	Yes	Yes
controls	No	Yes	No	Yes	No	Yes
control group	Border districts	Border districts	Neighboring states	Neighboring states	Major states	Major states

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

standard errors clustered at the district level

Table 3: Gross Value Added

	(1) log [GVA]	(2) log [GVA]	(3) log [GVA]	(4) log [GVA]	(5) log [GVA]	(6) log [GVA]
post*treat	0.122	0.0176	0.0310	0.00411	0.0546	0.0560
	(0.325)	(0.194)	(0.196)	(0.111)	(0.190)	(0.0986)
Constant	10.05***	9.001***	9.122***	8.753***	9.196***	9.553***
	(0.355)	(0.328)	(0.210)	(0.261)	(0.189)	(0.171)
Observations	13,377	13,371	62,102	62,068	267,317	267,235
R-squared	0.406	0.601	0.325	0.595	0.285	0.577
district FE	Yes	Yes	Yes	Yes	Yes	Yes
year dummy	Yes	Yes	Yes	Yes	Yes	Yes
2 digit industry FE	Yes	Yes	Yes	Yes	Yes	Yes
controls	No	Yes	No	Yes	No	Yes
control group	Border districts	Border districts	Neighboring states	Neighboring states	Major states	Major states

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

standard errors clustered at the district level

Table 4: Output

	(1)	(2)	(3)	(4)	(5)	(6)
	log [output]	log [output]	log [output]	log [output]	log [output]	log [output]
post*treat	0.129	0.0256	0.0729	0.0607	0.106	0.106
	(0.346)	(0.215)	(0.202)	(0.119)	(0.195)	(0.108)
Constant	10.75***	10.38***	9.781***	9.975***	10.00***	11.06***
	(0.451)	(0.407)	(0.185)	(0.288)	(0.159)	(0.207)
Observations	13,396	13,390	62,166	62,132	267,457	267,375
R-squared	0.450	0.646	0.351	0.622	0.335	0.615
district FE	Yes	Yes	Yes	Yes	Yes	Yes
year dummy	Yes	Yes	Yes	Yes	Yes	Yes
2 digit industry FE	Yes	Yes	Yes	Yes	Yes	Yes
controls	No	Yes	No	Yes	No	Yes
control group	Border districts	Border districts	Neighboring states	Neighboring states	Major states	Major states

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

standard errors clustered at the district level

Table 5: Registration with a government agency

	(1)	(2)	(3)	(4)	(5)	(6)
	registered	registered	registered	registered	registered	registered
post*treat	0.0497	0.0555	0.0489	0.0449	0.0475	0.0446
	(0.0552)	(0.0555)	(0.0395)	(0.0368)	(0.0374)	(0.0329)
Constant	0.237*	0.510***	0.0294	0.259***	0.148***	0.304***
	(0.136)	(0.156)	(0.0237)	(0.0674)	(0.0517)	(0.0563)
Observations	13,475	13,457	62,678	62,571	269,419	269,207
R-squared	0.189	0.286	0.134	0.258	0.164	0.301
district FE	Yes	Yes	Yes	Yes	Yes	Yes
year dummy	Yes	Yes	Yes	Yes	Yes	Yes
2 digit industry FE	Yes	Yes	Yes	Yes	Yes	Yes
controls	No	Yes	No	Yes	No	Yes
control group	Border districts	Border districts	Neighboring states	Neighboring states	Major states	Major states

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

standard errors clustered at the district level

Table 6: Young firm - started activity in the last 3 years

	(1)	(2)	(3)	(4)	(5)	(6)
	young	young	young	young	young	young
*post*treat*	-0.0875	-0.0744	-0.00674	-0.00725	-0.00935	-0.00880
	(0.0761)	(0.0586)	(0.0465)	(0.0403)	(0.0441)	(0.0409)
Constant	0.0320	-0.240	0.354***	0.105	0.254***	0.0419
	(0.0535)	(0.143)	(0.0867)	(0.126)	(0.0672)	(0.0761)
Observations	13,487	13,469	62,726	62,616	269,540	269,322
R-squared	0.112	0.165	0.104	0.119	0.083	0.090
district FE	Yes	Yes	Yes	Yes	Yes	Yes
year dummy	Yes	Yes	Yes	Yes	Yes	Yes
2 digit industry FE	Yes	Yes	Yes	Yes	Yes	Yes
controls	No	Yes	No	Yes	No	Yes
control group	Border districts	Border districts	Neighboring states	Neighboring states	Major states	Major states

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

standard errors clustered at the district level

Table 7: Self reported to be contracting in size

	(1)	(2)	(3)	(4)	(5)	(6)
	contracted	contracted	contracted	contracted	contracted	contracted
*post*treat*	0.112	0.0974	0.125*	0.110	0.120*	0.113*
	(0.0877)	(0.0902)	(0.0671)	(0.0695)	(0.0626)	(0.0650)
Constant	0.472**	0.244	0.0974	-0.0118	0.118	0.0967
	(0.173)	(0.167)	(0.0981)	(0.107)	(0.0866)	(0.0921)
Observations	11,102	11,088	53,123	53,023	238,618	238,417
R-squared	0.096	0.103	0.091	0.100	0.096	0.099
district FE	Yes	Yes	Yes	Yes	Yes	Yes
year dummy	Yes	Yes	Yes	Yes	Yes	Yes
2 digit industry FE	Yes	Yes	Yes	Yes	Yes	Yes
controls	No	Yes	No	Yes	No	Yes
control group	Border districts	Border districts	Neighboring states	Neighboring states	Major states	Major states

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

standard errors clustered at the district level

Table 8: Probability of registration by firm type

	(1) registered	(2) registered	(3) registered	(4) registered	(5) registered	(6) registered
post*treat	0.0205	0.0225	0.0250	0.131*	0.128**	0.130***
	(0.0582)	(0.0410)	(0.0392)	(0.0648)	(0.0494)	(0.0466)
Constant	0.0804	0.0757	0.259***	0.861*	0.495***	0.683***
	(0.156)	(0.0494)	(0.0485)	(0.421)	(0.118)	(0.0919)
Observations	8,318	36,886	176,212	5,139	25,685	92,995
R-squared	0.205	0.128	0.135	0.447	0.350	0.324
district FE	Yes	Yes	Yes	Yes	Yes	Yes
year dummy	Yes	Yes	Yes	Yes	Yes	Yes
2 digit industry FE	Yes	Yes	Yes	Yes	Yes	Yes
controls	Yes	Yes	Yes	Yes	Yes	Yes
control group	Border districts	Neighboring states	Major states	Border districts	Neighboring states	Major states
Sample	OAME only	OAME only	OAME only	NDME and DME	NDME and DME	NDME and DME

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

standard errors clustered at the district level

Table 9: Employment by firm type

	(1) log [employment]	(2) log [employment]	(3) log [employment]	(4) log [employment]	(5) log [employment]	(6) log [employment]
post*treat	0.0186	-0.00220	0.0249	0.0602	0.0623	0.0208
	(0.0349)	(0.0280)	(0.0244)	(0.0409)	(0.0379)	(0.0333)
Constant	0.808***	0.951***	1.133***	0.333	-0.335**	-0.248***
	(0.133)	(0.0606)	(0.0493)	(0.524)	(0.140)	(0.0927)
Observations	8,321	36,896	176,258	5,145	25,711	93,050
R-squared	0.161	0.221	0.234	0.717	0.662	0.665
district FE	Yes	Yes	Yes	Yes	Yes	Yes
year dummy	Yes	Yes	Yes	Yes	Yes	Yes
2 digit industry FE	Yes	Yes	Yes	Yes	Yes	Yes
controls	Yes	Yes	Yes	Yes	Yes	Yes
control group	Border districts	Neighboring states	Major states	Border districts	Neighboring states	Major states
Sample	OAME only	OAME only	OAME only	NDME and DME	NDME and DME	NDME and DME

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

standard errors clustered at the district level

21

Table 10: Gross value added by firm type

	(1) log [GVA]	(2) log [GVA]	(3) log [GVA]	(4) log [GVA]	(5) log [GVA]	(6) log [GVA]
*post*treat*	0.00407	-0.0415	0.0539	0.0177	0.169	0.0671
	(0.212)	(0.125)	(0.117)	(0.220)	(0.173)	(0.147)
Constant	9.109***	9.520***	10.47***	8.892***	9.246***	9.776***
	(0.602)	(0.402)	(0.197)	(0.768)	(0.361)	(0.255)
Observations	8,247	36,502	174,661	5,124	25,566	92,574
R-squared	0.462	0.405	0.380	0.478	0.511	0.511
district FE	Yes	Yes	Yes	Yes	Yes	Yes
year dummy	Yes	Yes	Yes	Yes	Yes	Yes
2 digit industry FE	Yes	Yes	Yes	Yes	Yes	Yes
controls	Yes	Yes	Yes	Yes	Yes	Yes
control group	Border districts	Neighboring states	Major states	Border districts	Neighboring states	Major states
Sample	OAME only	OAME only	OAME only	NDME and DME	NDME and DME	NDME and DME

Robust standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

standard errors clustered at the district level

Table 11: Output by firm type

	(1) log [output]	(2) log [output]	(3) log [output]	(4) log [output]	(5) log [output]	(6) log [output]
*post*treat*	0.0480	0.0294	0.124	-0.105	0.191	0.0389
	(0.229)	(0.127)	(0.120)	(0.245)	(0.187)	(0.159)
Constant	10.18***	10.64***	11.81***	10.42***	10.39***	11.36***
	(0.794)	(0.473)	(0.227)	(0.529)	(0.420)	(0.318)
Observations	8,257	36,543	174,732	5,133	25,589	92,643
R-squared	0.523	0.459	0.455	0.578	0.547	0.519
district FE	Yes	Yes	Yes	Yes	Yes	Yes
year dummy	Yes	Yes	Yes	Yes	Yes	Yes
2 digit industry FE	Yes	Yes	Yes	Yes	Yes	Yes
controls	Yes	Yes	Yes	Yes	Yes	Yes
control group	Border districts	Neighboring states	Major states	Border districts	Neighboring states	Major states
Sample	OAME only	OAME only	OAME only	NDME and DME	NDME and DME	NDME and DME

Robust standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

standard errors clustered at the district level

Figure 1: Map of India

PAKISTAN

CHINA

Himachal Pradesh

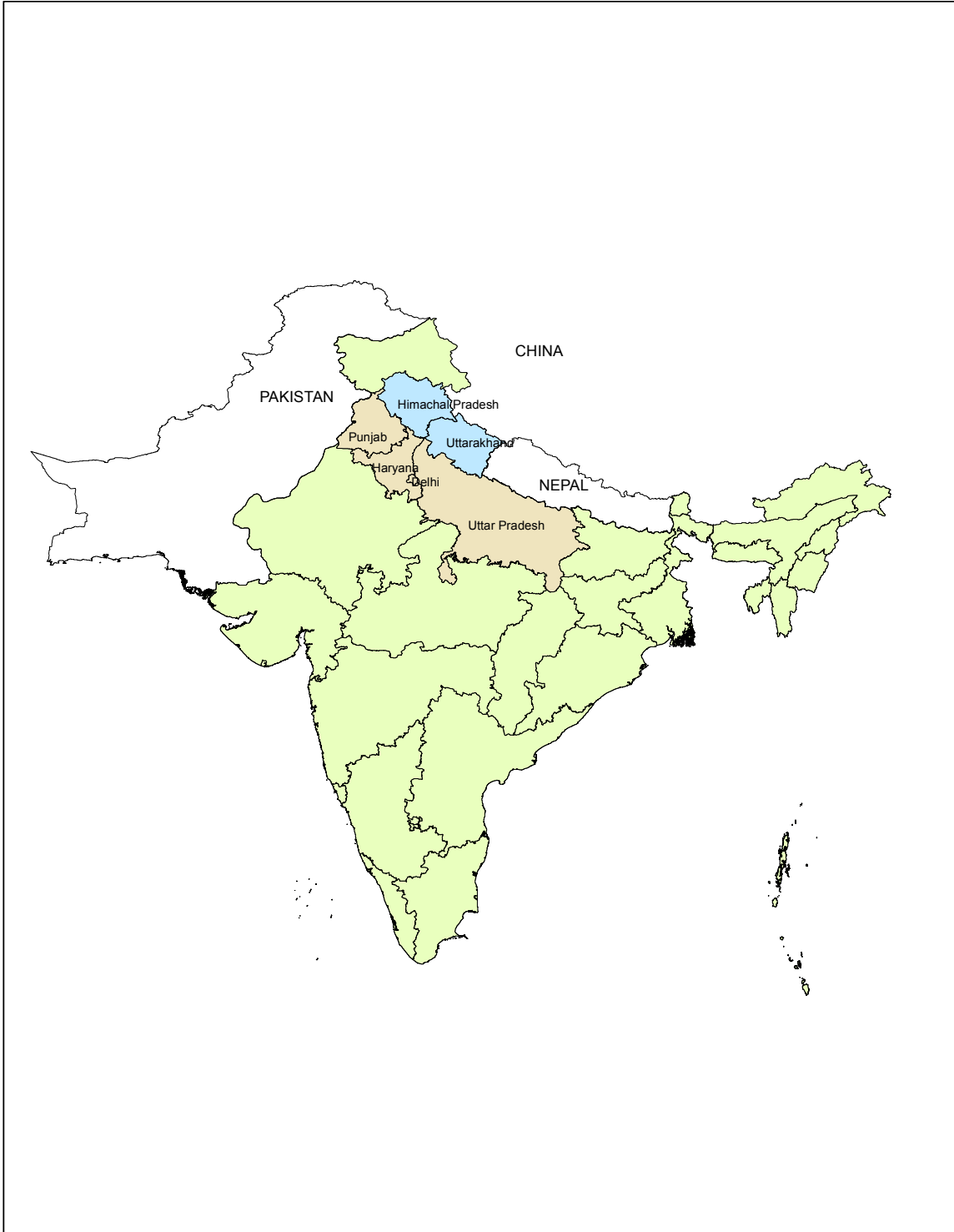Punjab

Uttarakhand

Haryana

Delhi

NEPAL

Uttar Pradesh

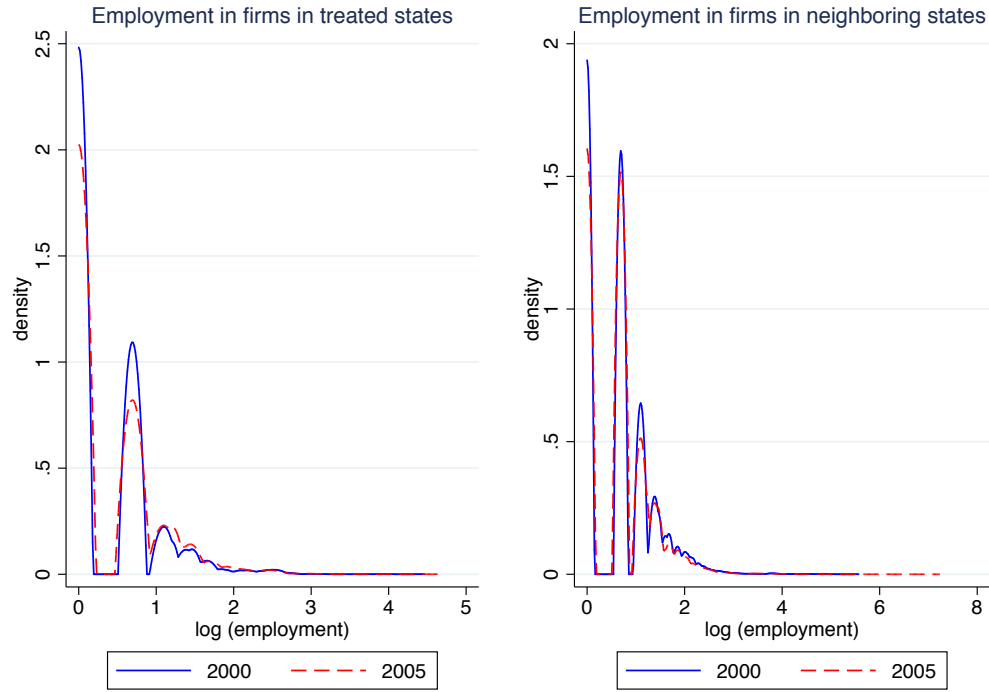Figure 2: Employment distribution
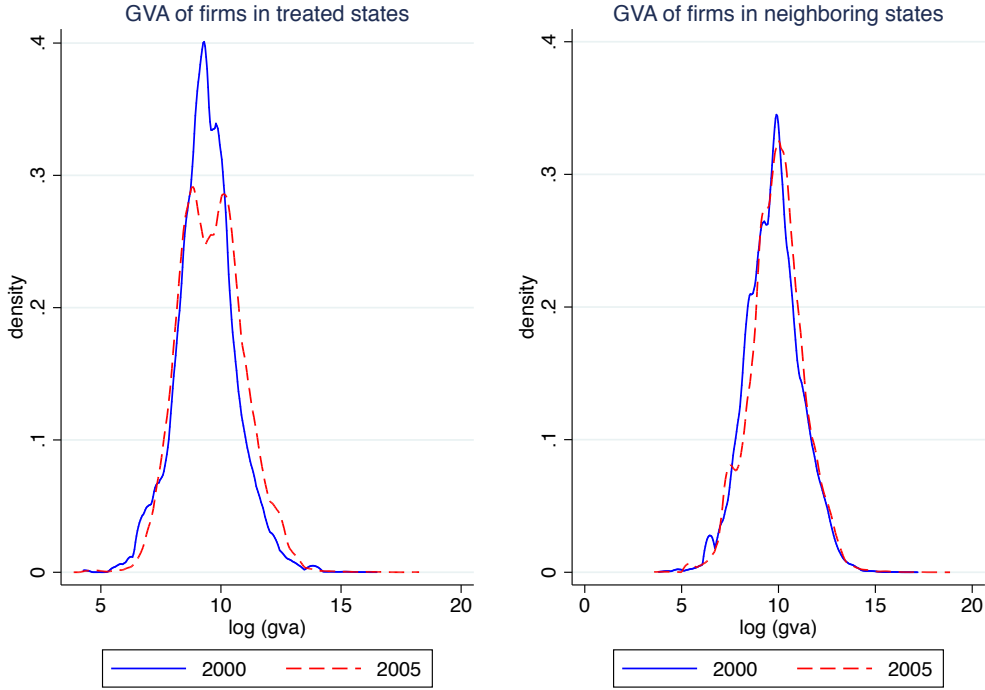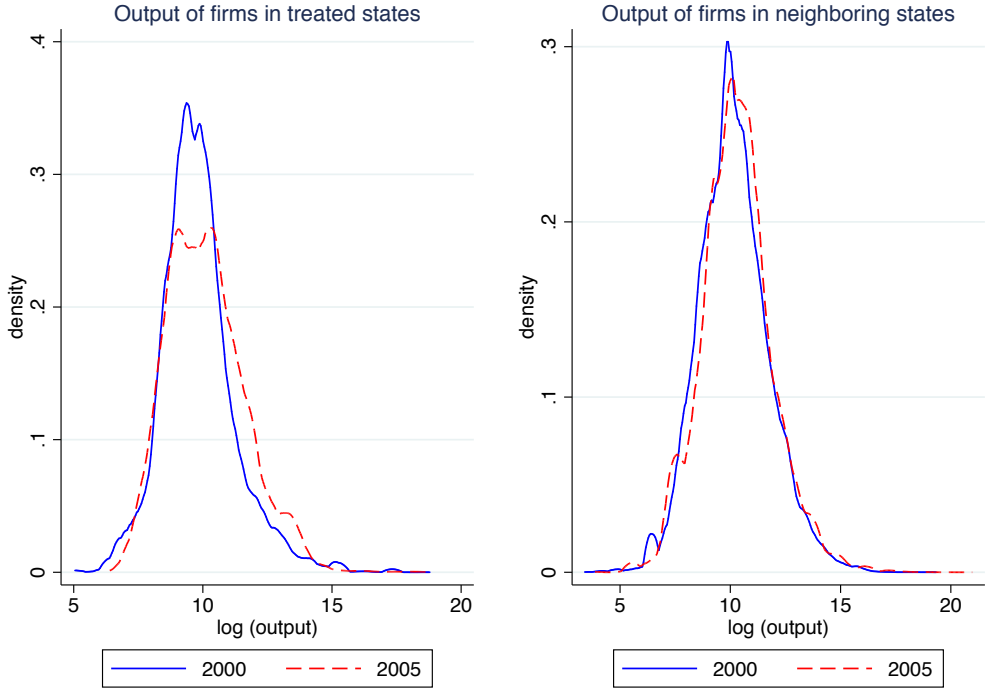
Figure 3: GVA distribution

Figure 4: Output distribution

Appendix

Treated states: Uttarakhand and Himachal Pradesh.

Neighboring states: Haryana, Punjab, Delhi, Chandigarh, Uttar Pradesh.

All major states: Neighboring states plus Rajasthan, Bihar, Andhra Pradesh, Chhattisgarh, Maharashtra, Madhya Pradesh, Orissa, Goa, Kerala, Karnataka, Tamil Nadu, Jharkhand, Gujarat, West Bengal.

Bordering districts:

Himachal Pradesh	Uttarakhand	Uttar Pradesh	Haryana	Punjab
Sirmaur	Udham Singh Nagar	Pilibhit	Yamunanagar	Pathankot
Solan	Nainital	Bareilly	Ambala	Hoshiarpur
Bilaspur	Pauri	Rampur	Panchkula	Rupnagar
Una	Haridwar	Moradabad	-	SAS Nagar
Kangra	Dehradun	Bijnor	-	Gurdaspur
Chamba	-	Muzzafarnagar	-	-
-	-	Saharanpur	-	-