Barriers to Competition and Productivity: Evidence from India
Supplementary Appendix

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Appendix B: Modified Levinsohn-Petrin Methodology

We assume that our value added production function $v = f(l, n, k, \omega)$, is part of a more general production function separable in all intermediate inputs $Y = g(f(l, n, k, \omega), h(\Gamma, \omega))$ where Γ is a vector of intermediate inputs.

Let ι be one intermediate input, which LP assume has a demand function of the form:$\iota_{it} = \iota_t(\omega_{it}, k_{it})$. Other possible state variables not explicitly included in the above input demand function include prices of inputs and output(s). We assume input and output prices are fixed across firms within the same industry, but allow for the common prices to change over time by indexing the input demand function by t.[1] Assuming monotonicity, i.e. input choice is strictly increasing in productivity for all relevant capital levels,[2] the input demand function can be inverted to yield an representation for the unobserved productivity: $\omega_{it} = \omega_t(\iota_{it}, k_{it})$.

Then, assuming the monotonicity condition holds, we can estimate the coefficients on the labor inputs by estimating the following regression:

$$v_{it} = \beta_l l_{it} + \beta_n n_{it} + \phi_t(\iota_{it}, k_{it}) + \eta_{it} \quad \text{(Step 1)}$$

where:

$$\phi_t(\iota_{it}, k_{it}) = \beta_k k_{it} + \omega_t(\iota_{it}, k_{it})$$

We use quantity of electricity consumed ς_t as the input proxy ι_t. We specify $\omega_t(\iota_{it}, k_{it})$ as a polynomial function in its arguments (including the absorbed intercept term and dropping the firm index i for expositional convenience) as follows:

$$\begin{aligned}
\omega_t(\varsigma_t, k_t) = \quad & \alpha_{11}\varsigma_t + \alpha_{12}\varsigma_t^2 + \alpha_{13}\varsigma_t^3 + \alpha_{14}k_t + \alpha_{15}k_t\varsigma_t + \alpha_{16}k_t\varsigma_t^2 \\
& + \alpha_{17}k_t^2 + \alpha_{18}k_t^2\varsigma_t + \alpha_{19}k_t^3 \\
& + \alpha_{21}t_2\varsigma_t + \alpha_{22}t_2\varsigma_t^2 + \alpha_{23}t_2\varsigma_t^3 + \alpha_{24}t_2k_t + \alpha_{25}t_2k_t\varsigma_t + \alpha_{26}t_2k_t\varsigma_t^2 \\
& + \alpha_{27}t_2k_t^2 + \alpha_{28}t_2k_t^2\varsigma_t + \alpha_{29}t_2k_t^3 \\
& + \alpha_{31}t_3\varsigma_t + \alpha_{32}t_3\varsigma_t^2 + \alpha_{33}t_3\varsigma_t^3 + \alpha_{34}t_3k_t + \alpha_{35}t_3k_t\varsigma_t + \alpha_{36}t_3k_t\varsigma_t^2 \\
& + \alpha_{37}t_3k_t^2 + \alpha_{38}t_3k_t^2\varsigma_t + \alpha_{39}t_3k_t^3
\end{aligned}$$

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[1] A sufficient condition for this to hold is perfect (or symmetric cournot) competition within an industry. This allows for symmetric markups (as assumed for example in Harrison 1994).

[2] LP show that, given production technology $Y = f(K, L, \iota, \omega)$ then the five assumptions (i) f(.) is twice continuously differentiable in L and ι, (ii) investment does not respond to this period's productivity, (iii) capital is fixed, (iv) firms take input prices and output prices as given, (v) all cross derivatives exist, along with the condition that $f_{\iota L} f_{L\omega} > f_{LL} f_{\iota\omega}$ are sufficient to ensure that the input demand function $\iota(\omega : p_l, p_\iota, K)$ is strictly increasing in ω, i.e. for the monotonicity condition to hold.

where $t_2 = 1$ for years 1990, 1991 and 1992, and $t_3 = 1$ for years 1993, 1994 and 1995.

Identifying the coefficient on the capital variable requires additional assumptions and a second stage estimation procedure. The moment condition that LP propose uses panel information to identify the capital coefficient. LP assume that:

$$E[k_{i,t}.\{\omega_{i,t} - E[\omega_{i,t}|\omega_{i,t-1}]\}] = 0 \tag{1}$$

This follows from a behavioral assumption that capital does not respond to "surprises" in productivity, or equivalently from assuming that $\{\omega_{i,t}\}_{i=1}^{\infty}$ follows a stochastic first order Markov process.

The LP methodology could be adapted to a repeated cross-section context by making the broader assumption that $\omega_{i,t}$ is uncorrelated with the choice of capital $k_{i,t}$ (which is arguably fixed in the short run). This moment condition is discussed by Griliches and Mairesse (1995), but they suggest this assumption may be too restrictive, as capital is likely to respond to any persistent component of ω_{it}. Instead we propose a less restrictive moment condition, which can be used in the repeated cross-section context. Instead of using last period's productivity for each firm (unobservable in our data), we use the average productivity in the previous period for a closely matched industry-location-size cell (observable in our data) as the predictor for this period firm productivity. This attempts to approximate the moment condition in equation 1 as closely as possible, given the limitations of our data.[3]

To implement this approach, we sub-divide the data into industry-location-size cells and estimate the average productivity for each cell in every period. Then our modified moment condition replacing equation 1 is given by:

$$k_{i,t}.\{\omega_{i,t} - E[\omega_{i,t}|\bar{\omega}_{i,t-1}]\} = 0 \tag{2}$$

where:

$$\bar{\omega}_{i,t-1} = \frac{1}{m_{j_i}} \sum_{s=1}^{m_{j_i}} \omega_{s,t-1} \tag{3}$$

where j_i indexes the industry-location-size cell to which firm i belongs, and m_{j_i} is the number of observations in cell j.

As in the LP methodology, we then identify the coefficient on the capital variable (β_k) by considering the second step regression:

$$v^*_{i,t} = \beta_k k_{i,t} + E[\omega_{i,t}|\bar{\omega}_{i,t-1}] + \eta^*_{i,t} \tag{Step 2}$$

where $v^*_{i,t} = v_{i,t} - (\beta_l l_{i,t} + \beta_n n_{i,t})$ and $\eta^*_{i,t} = \{\omega_{i,t} - E[\omega_{i,t}|\bar{\omega}_{i,t-1}]\} + \eta_{i,t}$.

The specific estimation algorithm to obtain the capital coefficient is as follows:

i. Start with a candidate estimate[4] of the capital coefficientβ_{k*}.

[3] This is justified by the assumption that firm specific productivity ω_{it} is given by the cell specific productivity $\bar{\omega}_{i,t}$ plus a random mean-zero shock, along with the assumption that the cell specific productivity follows a stochastic first order Markov process. Then the best predictor for the current firm-specific productivity would be the last period cell specific productivity. One alternative is to assume that cell-specific fixed effects captures the transmitted component of productivity (ω_{it}). Our approach is more flexible in that it allows the cell specific mean productivity to vary over time.

[4] While we could use some clever starting point, since we expect the coefficient on capital to be within the range 0 to 0.6 (the OLS analysis yields capital coefficients in the range of 0.03 to 0.21), we simply search over this range. We cross-checked the final estimate to ensure that the estimated value is interior to this range.

ii. From the results of the first stage regression, obtain:

$$\hat{\phi}_t = \hat{v}_t - \hat{\beta}_l l_t - \hat{\beta}_n n_t$$

iii. Then obtain:

$$\widehat{\omega_t} = \hat{\phi}_t - \beta_{k*} k_t$$

iv. Estimate the mean productivity for each industry -size-location cell using:

$$\widehat{\bar{\omega}_{t-1}} = \frac{1}{m_j} \sum_{s=1}^{m_j} \widehat{\omega_{s,t-1}}$$

where m_j is the number of observations in cell j.

v. Regress $\widehat{\omega_t}$ on $\widehat{\bar{\omega}_{t-1}}$ and $\widehat{\bar{\omega}^2_{t-1}}$ and use the predicted values to form $E[\widehat{\omega_t | \bar{\omega}_{t-1}}]$.

vi. Obtain $\hat{v_t^*} = v_t - \hat{\beta}_l l_t - \hat{\beta}_n n_t$.

vii. Form $\hat{\eta_t^*} = \hat{v_t^*} - \beta_{k*} k_t - E[\widehat{\omega_t | \bar{\omega}_{t-1}}]$.

vii. Estimate β_k by minimizing the sum (over all the firm-year observations) of the squared residuals in Step 2:

$$\operatorname*{Min}_{\beta_{k*}} \left\{ \sum_i \left(\hat{v_{it}^*} - \beta_{k*} k_{it} - E[\widehat{\omega_{it} | \bar{\omega}_{it-1}}] \right)^2 \right\}$$

As discussed in Levinsohn-Petrin (2003a), a bootstrapping procedure is used to estimate the standard errors.

Appendix C: Industry Equilibrium with Heterogenous Firms

In this appendix, we present a model of industry equilibrium with heterogenous firms that shows how reductions in sunk costs of entry increase average productivity and reduce dispersion. This model draws heavily on Syverson, 2004b; we assume a Cournot-Nash (instead of Bertrand-Nash) equilibrium. We focus on factors driving productivity dispersion in the cross-section of industries, and hence we abstract from the dynamics of industry equilibrium. An industry is composed of a continuum of producers of mass N. Each producer is indexed by i (I is the set of industry producers) and produces a distinct variety of the industry product. The representative industry consumer has the following preferences over varieties:

$$U = y + \alpha \int_{i \in I} q_i di - \frac{1}{2}\eta \left(\int_{i \in I} q_i di \right)^2 - \frac{1}{2}\gamma \int_{i \in I} q_i^2 di \tag{4}$$

where y is the quantity of numeraire good, q_i is the quantity of good i consumed, $\alpha > 0$, $\eta > 0$ and $\gamma \geq 0$. Note that γ captures the love for variety. With higher γ, increasing consumption of one good reduces utility derived from it, so that the consumer would buy another variety even at a higher price (thus allowing some less productive producers of another variety to survive in the equilibrium). The parameters α and η shift the demand for the industries output relative to the numeraire good. Now defining: $\bar{q} = \frac{1}{N} \int_{i \in I} q_i di$, from the maximization of the utility function in equation 4, we can derive the following demand function:

$$p_i = \alpha - \gamma q_i - \eta N \bar{q} \tag{5}$$

Output is produced using a single factor labor (l_i), and is linearly related to the productivity term (θ_i), so that the production function is:

$$q_i = \theta_i l_i \tag{6}$$

This yields the following per period profit function for producer i:

$$\Pi_i = p_i \theta_i l_i - w l_i - F_c \tag{7}$$

where w is the (exogenous) wage rate and F_c is the fixed costs of producing output per period. Substituting from demand equation 5 and production function 6, and assuming that each firm's output is very small compared to the aggregate output, we can write:

$$\Pi_i = (\alpha - \gamma \theta_i l_i - \eta N \bar{q}) \theta_i l_i - w l_i - F_c \tag{8}$$

A Cournot-Nash profit maximization, where every producer maximizes profit by choosing output level (by choosing input labor level), yields optimal output level:

$$q_i^* = \frac{1}{2\gamma} \left[\alpha - \eta N \bar{q} - \frac{w}{\theta_i} \right] \tag{9}$$

Substituting back the optimal output level in equation 9 into the profit function in equation 8 yields (after some algebra):

$$\Pi_i = \frac{1}{4\gamma} \left(\alpha - \eta N \bar{q} - \frac{w}{\theta_i} \right)^2 - F_c \tag{10}$$

This equation implies that any producer who has productivity level lower than a cutoff productivity level θ_i^*, would not be able to earn positive profits. Solving for this cutoff productivity θ^* yields:

$$\theta^* = \frac{w}{\alpha - \eta N\bar{q} - \sqrt{4\gamma F_c}} \tag{11}$$

Substituting for $\bar{q}$ from equation 11 into equation 10 yields (after some algebra) the following expression for the profit for producer i in terms of the cutoff productivity level θ^*:

$$\Pi_i = \frac{1}{4\gamma}\left[\sqrt{4\gamma F_c} + w\left(\frac{1}{\theta*} - \frac{1}{\theta_i}\right)\right]^2 - F_c \tag{12}$$

A large pool of ex-ante identical firms have to pay a sunk entry cost s to receive a productivity draw from a known distribution $g(\theta)$. Only those receiving a productivity draw above the cutoff productivity level θ^* can produce output in equilibrium. Thus expected profit from paying sunk cost s is the expectation of equation 12 over the distribution $g(\theta)$ if $\theta \geq \theta^*$, and zero if $\theta < \theta^*$. Thus, expected gain depends on the cutoff productivity level θ^*; free entry determines this value by setting the net expected gain from entry equal to 0. Thus, in equilibrium, θ^* is such that the expected value of entry $V^e = 0$:

$$V^e = \int_{\theta^*}^{\infty}\left\{\frac{1}{4\gamma}\left[\sqrt{4\gamma F_c} + w\left(\frac{1}{\theta*} - \frac{1}{\theta}\right)\right]^2 - F_c\right\} g(\theta)d\theta - s = 0 \tag{13}$$

This expression summarizes the industry equilibrium and allows us to perform comparative statics on the equilibrium effect of various factors (such as entry costs, fixed costs of operation, etc.) on the cutoff productivity level (which in turn determines the dispersion, mean and aggregate cutoff productivity levels, assuming $g(\theta)$ is independent of the factors). The effect of any factor x on the equilibrium cutoff productivity level can be derived from the implicit function theorem by setting:

$$\frac{d\theta^*}{dx} = \frac{-\partial V^e/\partial x}{\partial V^e/\partial \theta^*} \tag{14}$$

In equilibrium, we can show that an increase in factor prices would lead to an increase in the cutoff productivity level.

Proposition 1. *The equilibrium cutoff productivity level θ^* increases with decrease sunk costs of entry; ie $\frac{d\theta^*}{ds} < 0$. Consequently the mean productivity goes up, and the dispersion in productivity falls, with a decrease in sunk costs of entry.*

Proof.

$$\begin{aligned}\frac{\partial V^e}{\partial \theta^*} &= \int_{\theta^*}^{\infty}\left\{\frac{1}{2\gamma}\left[\sqrt{4\gamma F_c} + w\left(\frac{1}{\theta*} - \frac{1}{\theta}\right)\right]\left(-\frac{w}{\theta^{*2}}\right)\right\} g(\theta)d\theta \\ &\quad - \left\{\frac{1}{4\gamma}\left[\sqrt{4\gamma F_c} + w\left(\frac{1}{\theta*} - \frac{1}{\theta^*}\right)\right]^2 - F_c\right\} g(\theta^*) < 0\end{aligned}$$

since the second term is zero,[5] and for the first term the expression under the integral is negative. Now note that

$$\frac{\partial V^e}{\partial s} = -1 < 0$$

[5]Note that the second term denotes the change in value of entry by allowing a marginal firm to enter, which is zero.

This yields:

$$\frac{d\theta^*}{ds} = \frac{-\partial V^e/\partial s}{\partial V^e/\partial \theta^*} < 0$$

The positive impact of an decrease in sunk costs on mean productivity $\bar{\theta}$ follows directly from the fact that:

$$\frac{\partial \bar{\theta}}{\partial \theta^*} \quad = \quad \frac{\partial}{\partial \theta^*} \int_{\theta^*}^{\infty} \theta g(\theta) d\theta = -\theta^* g(\theta^*) < 0$$

An increase in the productivity cutoff (θ^*) directly translates to a reduction in dispersion. □

Thus, a decline in entry barriers forces inefficient firms to exit, improving productivity through a reallocation of resources to more efficient firms. Note that in this mode there is no improvement occurring within the set of surviving firms (i.e. no gains from reduction in slack or other endogenous sources of inefficiency).

Appendix TABLE A.2

DIFFERENCE-IN-DIFFERENCE ESTIMATES OF THE COMPONENTS OF OUTPUT GROWTH: EXCLUDING NEW ENTRANTS

	(1)	(2)	(3)	(4)	(5)	(6)
	Output growth (2)+(3)+(4)	Input growth	Inter-industry reallocation	Aggregate productivity growth (5)+(6)	Intra-plant productivity growth	Intra-industry reallocation
Panel 2: FDI liberalization effect						
FDI_LIB* I_(92-93)	0.158	0.085	0.019	0.054	0.084	-0.03
	[0.091]+	[0.057]	[0.033]	[0.067]	[0.063]	[0.049]
FDI_LIB* I_(94-95)	**0.231**	**0.018**	**0.014**	**0.199**	**0.177**	**0.022**
	[0.088]**	**[0.060]**	**[0.042]**	**[0.061]****	**[0.049]****	**[0.047]**
Observations	1819	1819	1819	1819	1819	1819
R-squared	0.14	0.14	0.22	0.12	0.05	0.05
Panel 2: Tariff liberalization effect						
TAR_LIB* I_(92-93)	0.047	-0.038	0.001	0.084	0.145	-0.061
	[0.114]	[0.067]	[0.046]	[0.064]	[0.063]*	[0.053]
TAR_LIB* I_(94-95)	**0.102**	**-0.049**	**-0.009**	**0.160**	**0.140**	**0.020**
	[0.105]	**[0.064]**	**[0.050]**	**[0.068]***	**[0.054]****	**[0.045]**
Observations	1929	1929	1929	1929	1929	1929
R-squared	0.20	0.18	0.25	0.18	0.09	0.09
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Sample excludes new entrants defined as plants with age <5 years (i.e. all plants that began production within the last 4 years), so that the 1994-95 effects are measured using plants that entered pre-1991. `FDI_LIB'==1 if automatic approval for FDI investment up to 51% was allowed in the industry in 1991. `TAR_LIB'==1 if the drop in tariff rates between 1990 and 1992 was greater than 33%. `I_(92-93)' is a dummy for the years 1992 and 1993 and `I_(94-95)' is a dummy for the years 1994 and 1995. `Output growth' is the growth in industry aggregate value added. `Input Growth' is the growth in an industry aggregate input index Inter-industry reallocation is the covariance between growth in industry aggregate input index and the growth in industry aggregate productivity index. `Aggregate productivity growth' is the growth in industry aggregate productivity index. `Intra-plant productivity growth' is the growth in the industry aggregate productivity index resulting from change in mean firm level productivity. `Intra-industry reallocation' is the growth in the industry aggregate productivity index attributable to change in the covariance between intra-plant productivity and the plant level input index. Standard errors are adjusted for clustering at 4 digit NIC level. + indicates significance at 10% level, * indicates significance at 5% level and ** indicates significance at 1% level.

Appendix TABLE A.3

EFFECTS OF FDI AND TARIFF LIBERALIZATION ON PRODUCTIVITY: EXCLUDING NEW ENTRANTS

	(1)	(2)	(3)	(4)	(5)	(6)
	ALL	EXCL NEW	ALL	EXCL NEW	ALL	EXCL NEW
Dependent variable	LP_TFP	LP_TFP	OLS_TFP	OLS_TFP	LABPROD	LABPROD
FDI_LIB*I_(92-93)	-0.037	-0.052	-0.047	-0.057	-0.044	-0.054
	[0.083]	[0.081]	[0.084]	[0.082]	[0.086]	[0.085]
FDI_LIB*I_(94-95)	**0.212**	**0.197**	**0.202**	**0.191**	**0.185**	**0.171**
	[0.085]*	**[0.085]***	**[0.086]***	**[0.086]***	**[0.090]***	**[0.091]+**
TAR_LIB*I_(92-93)	0.073	0.048	0.073	0.048	0.074	0.054
	[0.107]	[0.107]	[0.108]	[0.108]	[0.112]	[0.113]
TAR_LIB*I_(94-95)	**0.33**	**0.315**	**0.321**	**0.309**	**0.319**	**0.314**
	[0.121]**	**[0.123]***	**[0.124]***	**[0.125]***	**[0.133]***	**[0.134]***
Observations	337104	277965	337104	277965	337104	277965
R-squared	0.42	0.43	0.34	0.35	0.37	0.38
Adjrsq	0.423	0.427	0.344	0.35	0.371	0.383

Dependent variables `LP_TFP', is total factor productivity estimated using the LP methodology; OLS_TFP is total factor productivity measured using a linear regression method; LABPROD is log (real value added/employment). The sample "EXCL NEW" excludes plants with age <5 years (i.e. all plants that began production within the last 4 years), so that the 1994-95 effects are measured using plants that entered pre-1991. `FDI_LIB', `TAR_LIB', `I_(92-93)' and `I_(94-95)' are defined as in table above. Standard errors are adjusted for clustering at 4 digit NIC level. + indicates significance at 10% level, * indicates significance at 5% level and ** indicates significance at 1% level.

Appendix TABLE A.4a

EFFECTS OF FDI AND TARIFF LIBERALIZATION ON PRODUCTIVITY:
QUANTILES BY INDUSTRY-YEAR CELLS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable	Mean	P5	P10	P25	P50	P75	P90	P95
FDI_LIB * I_(92-93)	-0.034	-0.047	-0.077	-0.059	-0.039	-0.009	0.007	0.015
	[0.083]	[0.131]	[0.115]	[0.088]	[0.078]	[0.073]	[0.071]	[0.066]
FDI_LIB * I_(94-95)	**0.217**	**0.306**	**0.252**	**0.205**	**0.192**	**0.208**	**0.235**	**0.240**
	[0.085]*	**[0.119]***	**[0.108]***	**[0.090]***	**[0.085]***	**[0.079]***	**[0.075]***	**[0.072]***
TAR_LIB * I_(92-93)	0.071	0.086	0.074	0.049	0.066	0.079	0.087	0.046
	[0.107]	[0.165]	[0.141]	[0.117]	[0.102]	[0.095]	[0.090]	[0.083]
TAR_LIB * I_(94-95)	**0.327**	**0.375**	**0.368**	**0.314**	**0.327**	**0.324**	**0.32**	**0.266**
	[0.122]*	**[0.172]***	**[0.155]***	**[0.132]***	**[0.122]***	**[0.113]***	**[0.099]***	**[0.091]***
Observations	3701	3701	3701	3701	3701	3701	3701	3701
R-squared	0.85	0.70	0.75	0.81	0.85	0.87	0.88	0.87
Adjrsq	0.847	0.694	0.749	0.813	0.851	0.874	0.883	0.874

Dependent variables are the mean and various percentiles by 4-digit industry-year of `LP_TFP', the total factor productivity estimated using the LP methodology. Observations are weighted by the number of observations in the industry-year in the underlying establishment-level dataset. In estimating percentiles, sampling weights were adjusted for by duplicating observations after rounding the sampling weight to the nearest integer. Note that results in column 1 are almost identical to those in column 5 of Table 3, so that the rounding of sample weights does not induce a bias on the coefficients of interest in the mean regressions. All regressions include industry (4-digit) and year fixed effects. `FDI_LIB'==1 if automatic approval for FDI investment up to 51% was allowed in the industry in 1991. `TAR_LIB'==1 if the drop in tariff rates between 1990 and 1992 was greater than 33%. `I_(92-93)' is a dummy for the years 1992 and 1993 and `I_(94-95)' is a dummy for the years 1994 and 1995. Standard errors are adjusted for clustering at 4 digit NIC level. + indicates significance at 10% level, * indicates significance at 5% level and ** indicates significance at 1% level.

TABLE A.4b

EFFECTS OF FDI AND TARIFF LIBERALIZATION ON PRODUCTIVITY:
DISPERSION MEASURES BY INDUSTRY-YEAR CELLS

	(1)	(2)	(3)	(4)
	Difference p95-p5	Difference p90-p10	Difference p75-p25	Standard Deviation
FDI_LIB*I_(92-93)	0.062	0.083	0.05	0.021
	[0.091]	[0.063]	[0.028]+	[0.026]
FDI_LIB*I_(94-95)	**-0.066**	**-0.018**	**0.003**	**-0.039**
	[0.078]	**[0.056]**	**[0.026]**	**[0.024]+**
TAR_LIB*I_(92-93)	-0.04	0.013	0.03	-0.011
	[0.119]	[0.078]	[0.037]	[0.034]
TAR_LIB*I_(94-95)	**-0.109**	**-0.048**	**0.01**	**-0.041**
	[0.111]	**[0.078]**	**[0.034]**	**[0.034]**
Observations	3701	3701	3701	3620
R-squared	0.55	0.6	0.63	0.59
Adjrsq	0.548	0.602	0.626	0.587

Dependent variables are measures of dispersion by 4-digit industry-year of `LP_TFP', the total factor productivity estimated using the LP methodology. Observations are weighted by the number of observations in the industry-year in the underlying establishment-level dataset. In estimating percentiles, sampling weights were adjusted for by duplicating observations after rounding the sampling weight to the nearest integer. All regressions include industry (4-digit) and year fixed effects. `FDI_LIB'==1 if automatic approval for FDI investment up to 51% was allowed in the industry in 1991. `TAR_LIB'==1 if the drop in tariff rates between 1990 and 1992 was greater than 33%. `I_(92-93)' is a dummy for the years 1992 and 1993 and `I_(94-95)' is a dummy for the years 1994 and 1995. Standard errors are adjusted for clustering at 4 digit NIC level. + indicates significance at 10% level, * indicates significance at 5% level and ** indicates significance at 1% level.