# Regulation and Development

## EC307 ECONOMIC DEVELOPMENT

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## Lecture 12

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# READINGS

Tables and figures in this lecture are taken from:

Djankov, S., La Porta, R., Lopez-De-Silanes, F., and Shleifer, A. (2002). The Regulation Of Entry. *The Quarterly Journal of Economics*, 117(1): 1–37.

Besley, T. and Burgess, R. (2004). Can Labor Regulation Hinder Economic Performance? Evidence from India. *Quarterly Journal of Economics*, 119(1).

► **Class based on** Djankov, S., La Porta, R., Lopez-De-Silanes, F., and Shleifer, A. (2002). The Regulation Of Entry. *The Quarterly Journal of Economics*, 117(1):1–37.

♣ `Further Reading:` Laffont, Jean-Jacques. (2005). *Regulation and Development* (Federico Caffè Lectures). Cambridge University Press.

# *The Regulation Of Entry*

1. **Public Interest Theory of Regulation**

   - ○ unregulated markets exhibit frequent failures
     i.e., monopoly, externalities

   - ○ benevolent government screens entrants to correct these failures

   - ● *Prediction:* ↑ entry regulation ⇒ socially superior outcomes

2. **Public Choice Theory of Regulation**

   a) **Capture version:** Industry Incumbents capture regulation to keep out competitors and create rents (profits) for themselves

   - ● *Prediction:* ↑ regulation ⇒ social inferior outcomes (market power, incumbent's profits)

   a) **Toolbooth version:** Politician use regulation to create rents (extracted through campaign contributions, votes, bribes)

   - ● *Prediction:* ↑ regulation ⇒ social inferior outcomes (corruption)

**Djankov et al. (2002)** - *The Regulation Of Entry*

**Questions:**

What are the consequences of the regulation of entry?

Which kind of governments regulate entry?

**Economic theories of regulation:**

1. Public Interest

   ... *more representative governments ↑ entry regulations*

2. Public Choice

   ... *less representative governments ↑ entry regulations*

   a) Capture version:                    ... *to benefit the incumbent firms*
   b) Toolbooth:                          ... *to benefits themselves*

**Data:** Papers uses new data set on entry regulation (no. of procedures, time, cost) in 85 countries

**Findings:**

- Stricter regulation of entry is **not** associated with higher quality products, better pollution records or health outcomes or keener competition

- Representative Countries (countries with more open access to political power, constraints on the executive, and greater political rights) **have less** burdensome regulation of entry

  . . . even controlling for per capita income

. . . relates to views about the role of the state

**Paper's Limitation:** main source of identification is cross-sectional

Prologue
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Djankov et al. (2002)
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Role of State
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Besley & Burgess (2004)
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# SUMMARY

○ *More Interventionist Governments & less democratic governments* regulate entry more heavily (even after controlling for level of economic development)

○ *Heavier Regulation of entry* associated with
   - *Greater corruption*
   - *Larger unofficial Economy*
   - *No better quality of public good*

→ Evidence supports *public choice* but not *public interest* theory

→ Regulation does not yield visible social benefit. Conversely, it appears to benefit politicians and bureaucrats.

Prologue

Djankov et al. (2002)
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TABLE I

LIST OF PROCEDURES FOR STARTING UP A COMPANY

This table provides a list of common procedures required to start up a company in the 85 countries of the sample.

**1. Screening procedures**
- Certify business competence
- Certify a clean criminal record
- Certify marital status
- Check the name for uniqueness
- Notarize company deeds
- Notarize registration certificate
- File with the Statistical Bureau
- File with the Ministry of Industry and Trade, Ministry of the Economy, or the respective ministries by line of business
- Notify municipality of start-up date
- Obtain certificate of compliance with the company law
- Obtain business license (operations permit)
- Obtain permit to play music to the public (irrespective of line of business)
- Open a bank account and deposit start-up capital
- Perform an official audit at start-up
- Publish notice of company foundation
- Register at the Companies Registry
- Sign up for membership in the Chamber of Commerce or Industry or the Regional Trade Association

**2. Tax-related requirements**
- Arrange automatic withdrawal of the employees' income tax from the company payroll funds
- Designate a bondsman for tax purposes
- File with the Ministry of Finance
- Issue notice of start of activity to the Tax Authorities
- Register for corporate income tax
- Register for VAT
- Register for state taxes
- Register the company bylaws with the Tax Authorities
- Seal, validate, rubricate accounting books

**3. Labor/social security-related requirements**
- File with the Ministry of Labor
- Issue employment declarations for all employees
- Notarize the labor contract
- Pass inspections by social security officials
- Register for accident and labor risk insurance
- Register for health and medical insurance
- Register with pension funds
- Register for Social Security
- Register for unemployment insurance
- Register with the housing fund

**4. Safety and health requirements**
- Notify the health and safety authorities and obtain authorization to operate from the Health Ministry
- Pass inspections and obtain certificates related to work safety, building, fire, sanitation, and hygiene

**5. Environment-related requirements**
- Issue environmental declaration
- Obtain environment certificate
- Obtain sewer approval
- Obtain zoning approval
- Pass inspections from environmental officials
- Register with the water management and water discharge authorities

FIGURE I

Start-up Procedures in New Zealand

Procedures are lined up sequentially on the horizontal axis and described in the text box. The time required to complete each procedure is described by the height
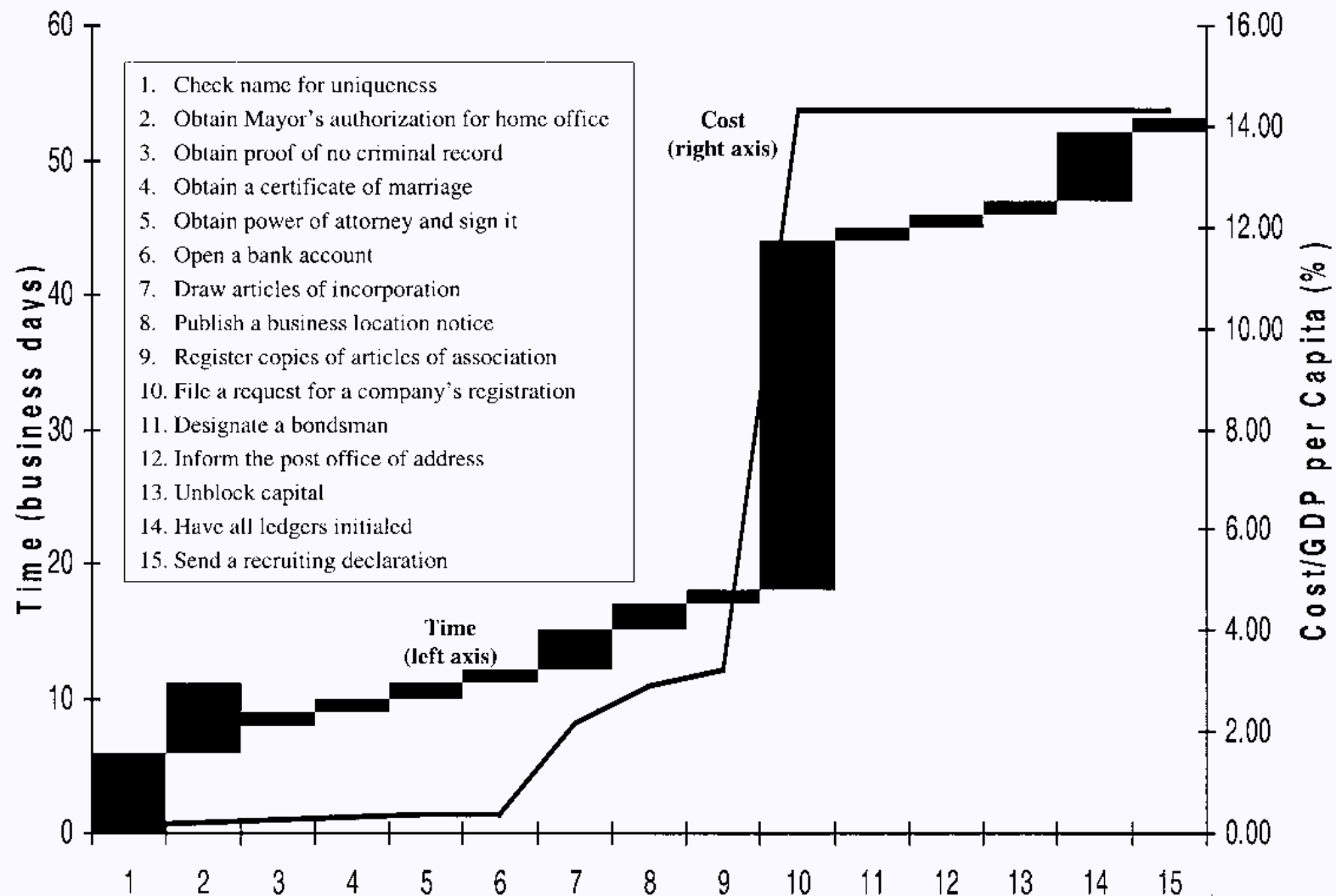
FIGURE II

Start-up Procedures in France

Procedures are lined up sequentially on the horizontal axis and described in the text box. The time required to complete each procedure is described by the height of the bar and measured against the left scale. Cumulative costs (as a percentage of per capita GDP) are plotted using a line and measured against the right scale.

TABLE IV

EVIDENCE ON REGULATION AND SOCIAL OUTCOMES

The table presents the results of OLS regressions using the following seven dependent variables: (1) Quality standards as proxied by the number of ISO 9000 certifications; (2) Water pollution; (3) Deaths from accidental poisoning; (4) Deaths from intestinal infection; (5) Size of the unofficial economy as a fraction of GDP; (6) Employment in the unofficial economy; and (7) Product market competition. The independent variables are the log of the number of procedures and the log of per capita GDP in dollars in 1999. Table II describes all variables in detail. Robust standard errors are shown below the coefficients.

| Dependent variable | Number of procedures | Ln GDP/POP$_{1999}$ | Constant | $R^2$ N |
| --- | --- | --- | --- | --- |
| Quality standards (ISO Certifications) | −0.2781$^a$ (0.0496) | | 0.7649$^a$ (0.1268) | 0.3311 85 |
| | −0.1595$^a$ (0.0443) | 0.0771$^a$ (0.0131) | −0.1140 (0.1484) | 0.5384 85 |
| Water pollution | 0.0127$^b$ (0.0084) | | 0.1557$^a$ (0.0174) | 0.0247 76 |
| | −0.0037 (0.0076) | −0.0131$^a$ (0.0027) | 0.2984$^a$ (0.0314) | 0.2310 76 |
| Deaths from accidental poisoning | 0.6588$^a$ (0.2057) | | 1.6357$^a$ (0.4381) | 0.1179 57 |
| | 0.0637 (0.1958) | −0.4525$^a$ (0.0933) | 6.8347$^a$ (1.0929) | 0.4109 57 |
| Deaths from intestinal infection | 2.3049$^a$ (0.3081) | | −2.2697$^a$ (0.6778) | 0.3451 61 |
| | 1.0501$^a$ (0.2971) | −0.8717$^a$ (0.1012) | 7.8494$^a$ (1.3048) | 0.6259 61 |
| Size of the unofficial economy$^d$ | 14.7553$^a$ (2.5698) | | −3.7982 (5.2139) | 0.2482 73 |
| | 6.4849$^b$ (2.5385) | −6.1908$^a$ (1.0834) | 67.1030$^a$ (13.7059) | 0.5187 73 |
| Employment in the unofficial economy | 19.4438$^a$ (2.5756) | | −4.1103 (5.9160) | 0.3132 46 |
| | 13.8512$^a$ (−3.6056) | −4.4585$^a$ (1.3918) | 41.5133$^b$ (17.6836) | 0.4477 46 |
| Product market competition | −0.4012$^a$ (0.1213) | | 5.7571$^a$ (0.2511) | 0.1405 54 |
| | −0.1418 (0.1202) | 0.2108$^a$ (0.0680) | 3.3579$^a$ (0.7749) | 0.3087 54 |

a. Significant at 1 percent; b. significant at 5 percent; c. significant at 10 percent.
d. The regression on the size of the unofficial economy controls for the log of GDP per capita plus unofficial economy income (i.e., GDP per capita* (1 + unofficial economy)) and not just by GDP per capita as all other regressions on the table do.

Prologue
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Djankov et al. (2002)
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Role of State
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Besley & Burgess (2004)
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## TABLE V
### EVIDENCE ON THE TOLLBOOTH THEORY

The table presents the results of OLS regressions using corruption as the dependent variable. The independent variables are (1) the log of the number of procedures; (2) the log of time; (3) the log of cost; and the log of per capita GDP in dollars in 1999. Panel A presents results for the 78 observations with available corruption data. Panel B reports results separately for the subsample of countries with GDP per capita in 1999 above and below the sample median. Table II describes all variables in detail. Robust standard errors are shown in parentheses below the coefficients.

| Panel A: Results for the whole sample | | | | | | |
|---|---|---|---|---|---|---|
| Independent variable | (1) | (2) | (3) | (4) | (5) | (6) |
| Number of procedures | $-3.1811^a$ (0.2986) | $-1.8654^a$ (0.2131) | | | | |
| Time | | | $-1.7566^a$ (0.1488) | $-0.8854^a$ (0.1377) | | |
| Cost | | | | | $-1.2129^a$ (0.1206) | $-0.4978^a$ (0.1285) |
| Ln GDP/POP$_{1999}$ | | $0.9966^a$ (0.0864) | | $0.9765^a$ (0.1014) | | $0.9960^a$ (0.1118) |
| Constant | $11.8741^a$ (0.7380) | $1.1345$ (0.9299) | $11.0694^a$ (0.5932) | $0.0677$ (1.1176) | $2.7520^a$ (0.2414) | $-4.0893^a$ (0.7867) |
| $R^2$ | 0.4656 | 0.8125 | 0.4387 | 0.7662 | 0.4256 | 0.7306 |
| N | 78 | 78 | 78 | 78 | 78 | 78 |

| Panel B: Results for countries above and below the world median GDP per capita | | | | | | |
|---|---|---|---|---|---|---|
| | Countries above median GDP/POP$_{1999}$ | | | Countries below median GDP/POP$_{1999}$ | | |
| Independent variable | (1) | (2) | (3) | (4) | (5) | (6) |
| Number of procedures | $-1.8729^a$ (0.2971) | | | $-0.7841^b$ (0.3304) | | |
| Time | | $-0.8135^a$ (0.1762) | | | $-0.0923$ (0.2850) | |
| Cost | | | $-0.5327^a$ (0.1894) | | | $-0.3408^a$ (0.1021) |
| Ln GDP/POP$_{1999}$ | $1.4811^a$ (0.2265) | $1.5871^a$ (0.2789) | $1.7621^a$ (0.2913) | $0.3993^b$ (0.1735) | $0.3680^c$ (0.1802) | $0.2117$ (0.1718) |
| Constant | $-3.6970$ (2.4628) | $-5.9027^c$ (2.9942) | $-11.3736^a$ (2.5773) | $2.3246^c$ (1.2849) | $1.0098$ (1.8813) | $1.3125$ (1.1136) |
| $R^2$ | 0.7820 | 0.7155 | 0.6728 | 0.2362 | 0.1324 | 0.2830 |
| N | 40 | 40 | 40 | 38 | 38 | 38 |

a. Significant at 1 percent; b. significant at 5 percent; c. significant at 10 percent.

TABLE VII

EVIDENCE ON REGULATION AND POLITICAL ATTRIBUTES

The table presents the results of running regressions for the log of the number of procedures as the dependent variable. We run seven regressions using various political indicators described in Table II and (log) GDP per capita. Robust standard errors are shown in parentheses below the coefficients.

| Dependent variable | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| Executive de facto independence | $-0.1249^a$ | | | | | | |
| | (0.0322) | | | | | | |
| Constraints on executive power | | $-0.1048^a$ | | | | | |
| | | (0.0352) | | | | | |
| Effectiveness of legislature | | | $-0.3301^a$ | | | | |
| | | | (0.0778) | | | | |
| Competition nominating | | | | $-0.2763^b$ | | | |
| | | | | (0.0999) | | | |
| Autocracy | | | | | $0.0545^b$ | | |
| | | | | | (0.0178) | | |
| Political rights | | | | | | $-0.3470$ | |
| | | | | | | (0.2185) | |
| French legal origin | | | | | | | $0.7245^a$ |
| | | | | | | | (0.0916) |
| Socialist legal origin | | | | | | | $0.4904^a$ |
| | | | | | | | (0.1071) |
| German legal origin | | | | | | | $0.7276^a$ |
| | | | | | | | (0.1363) |
| Scandinavian legal origin | | | | | | | $-0.0085$ |
| | | | | | | | (0.1733) |
| Ln GDP/POP$_{1999}$ | $-0.0491$ | $-0.0634^c$ | $-0.0087$ | $-0.0902^b$ | $-0.0867^a$ | $-0.0939^b$ | $-0.1434^a$ |
| | (0.0331) | (0.0352) | (0.0401) | (0.0358) | (0.0321) | (0.0386) | (0.0270) |
| Constant | $3.1782^a$ | $3.2040^a$ | $2.8709^a$ | $3.3540^a$ | $2.7457^a$ | $3.1850^a$ | $2.9492^a$ |
| | (0.2334) | (0.2408) | (0.2586) | (0.2641) | (0.2888) | (0.2599) | (0.1955) |
| $R^2$ | 0.3178 | 0.2872 | 0.3424 | 0.2475 | 0.2640 | 0.2350 | 0.6256 |
| N | 84 | 84 | 73 | 73 | 84 | 84 | 85 |

a. Significant at 1 percent; b. significant at 5 percent; c. significant at 10 percent.

We can identify three key phases in the history of policy making:

1.  **Era of the developmental state (1950-1980):**
    – emphasis on social & industrial planning

    a)  emphasis on state-led industrialization often behind trade and other barriers
    b)  state plays key role in directing and coordinating economic activity

    State seen as benevolent – questioned by some – for e.g Robert Bates (Harvard) & Peter Bauer (LSE)

    Mixed outcomes, i.e., successes in East Asia but failures in Africa and Latin America

2. **Washington Consensus Era (1988 – onwards):**
   … change begin in 1980s, .e.g., with Thatcher and Reagan

   a) benevolence of big government
   b) focus on providing "level playing field" and "getting prices right"
   c) emphasis on macro-economic stability and fiscal discipline
   d) emphasis on openness
   e) emphasis on privatisation

Prologue

Djankov et al. (2002)
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Role of State
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Besley & Burgess (2004)
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3. **Post 2000 emerging consensus:** with emphasis on the following

   a) governance and accountability

   … how policies are formulated and implemented is important

   b) political economy

   … ensuring that preferences of citizens reflected in policy

   c) institutional change        …  working with the "rules of the game"

   … taking into account economics, law, culture and politics

   d) microeconomics of growth

   … focus on property rights

   … engendering productivity and innovation

   … expansion of productive opportunities

These changes reflected in changing thinking on the role of state and specifically the role of *regulation* in engendering economic prosperity

# *Can Labor Regulation Hinder Economic Performance?*

**Question:**

*Is there a strong link between regulation & economic performance?*

Indian states have pursued different regulatory paths and have had very different economic performance

⇒ both time-series and cross-sectional variation in regulation

- labour regulations studied in the paper affect a particular sector, i.e., the registered manufacturing

*... it does not affect firms below a certain size*

- performance in the manufacturing sector is central to economic growth and poverty reduction

# STRUCTURAL CHANGE

Asian countries that have grown rapidly from a low base

- done so by increasing the importance of *manufacturing output*

- they have also more than halved poverty

○ Between 1960 & 1995, manufacturing as a share of GDP grew from

- 9% to 24% in Indonesia
- 8% to 26% in Malaysia
- 12.5% to 28% in Thailand

*… significant structural change in these countries*

→ 13% to 18% in India

*… disappointing after starting high at 13%*

# BACKGROUND

The Indian Government plays a central role in regulating industry.
Indian constitution 1949 -

   i. union list

  ii. state list

 iii. concurrent list

**Industrial (Regulation and Development) Act of 1952:** A central planning act, which states that

> *… it is in the public interest for central government to have full jurisdiction as regards regulation and development of all key industries in India*

                         … licensing used as planning tool

There are no state amendments to this act.

# BACKGROUND

Industrial relations is different – on the concurrent list

... both central and state governments have power to pass legislation.

**Industrial Disputes Act of 1947:** sets out the *conciliation, arbitration* and *adjudication procedures* to be followed in the case of an *industrial dispute*.

7 chapters:

  i.  definitions

 ii.  authorities under this act

iii.  dispute reference procedures

 iv.  powers and duties of authorities

  v.  rules and provisions for layoffs, retrenchment and closure

vii.  penalties for non-compliance and

vii.  miscellaneous issues

This Act has been *extensively amended* by state governments during the post-Independence period.

# CODING

Each amendment (121) coded according to its content as:

1 ... pro-worker

0 ... neutral

-1 ... pro-employer or pro-capital

- ○ State characteristics such as *literacy, population growth, development expenditure per-capita, taxes per capita, installed electricity capacity* are not significantly different between states across the period

- ● *Registered manufacturing growing more quickly in pro-employer states vis a vis neutral and pro-worker states.*

Prologue | Djankov et al. (2002) | Role of State | Besley & Burgess (2004)

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# EXAMPLES

Andhra Pradesh (1987): (Pro-employer Amendment):

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''If in the opinion of the state government it is
necessary or expedient for securing the public safety
or the maintenance of public order or services or
supplies essential to the life of the community or for
maintaining employment or industrial peace in the
industrial establishment it may issue an order which
(i) requires employers and workers to observe the terms
and conditions of an order and (ii) prohibits strikes and
lockouts in connection with any industrial dispute.''
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West Bengal: 1980: (Pro-worker Amendment):

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''The rules for layoffs, retrenchment and closure may according to
the discretion of the state government be applied to
industrial establishments which employ more than 50
workers.  Under the central act, these rules only apply
to establishments which employ more than 300 workers.''
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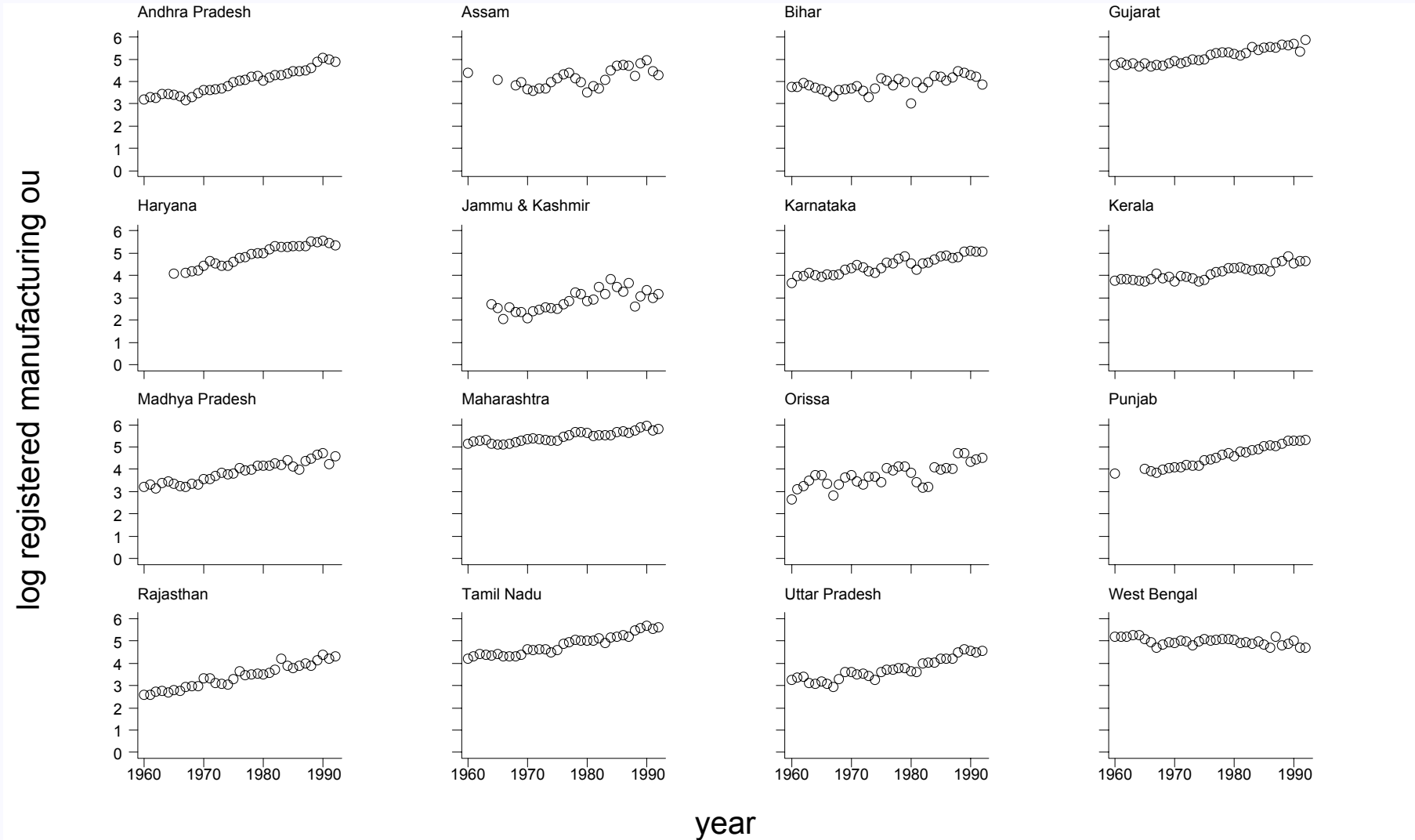
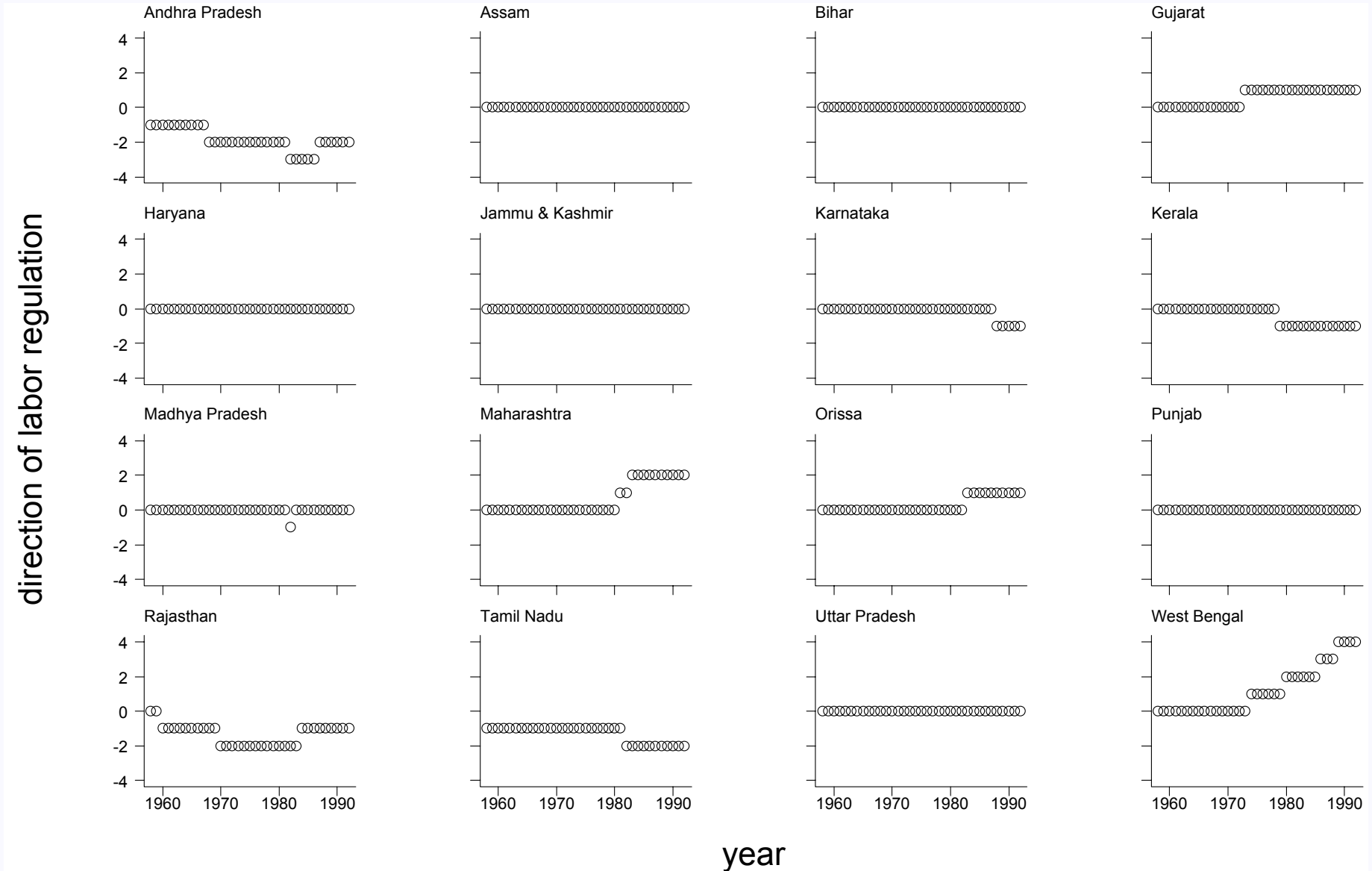Figure 1: Log Registered Manufacturing Output Per Capita: 1958-1992

Figure 2: Labor Regulation in India: 1958-1992

# REGISTERED AND UNREGISTERED MANUFACTURING

The paper uses the amendments to study the impact of labour market regulation on manufacturing performance and poverty.

Industrial Disputes Act only covers registered manufacturing.

- **Factories Act (1948):** *Registered manufacturing* - firms with more than 10 employees with electricity or more than 20 employees without electricity.
  All other firms classified as *Unregistered manufacturing*.

- *Manufacturing* accounted for 13% of state income in 1958 and 16% in 1992 (i.e., not huge part of the economy)

- *Registered Manufacturing* accounted for 51% of *total manufacturing* in 1958 and 64% in 1992

# THEORETICAL FRAMEWORK

There are two manufacturing sectors:

- **Registered::** firms can be of any size, but subject to government regulation affecting the way they bargain over wages

- **Unregistered:** firms are unregulated, but restricted in size

The timing of the firm's decision to register or not is as follows:

Stage
1  Firm decides whether to be registered or unregistered
2  decides how much capital to employ
3  how many labourers to employ & bargain with workers over rents

# RELATIVE PRICE EFFECT

- ○ Pro-worker Labour Regulation

- ⇒ Hiring and Firing labour becomes more expensive

- ○ Increases the cost of employing labour
  - Lower Employment: *firms substitute away from labour*
  - Lower Output: *With increased cost of production, it is optimal for the firms to produce lower output*
  - Smaller Manufacturing Sector: *Firms resist from being registered by remaining small*

Prologue      Djankov et al. (2002)      Role of State      Besley & Burgess (2004)

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# THE HOLDUP PROBLEM

○ Firm sink capital (invest) in anticipation of a return

○ Labour Regulations: As *worker's bargaining power increases,* workers are able to expropriate a greater part of the return once the capital has been sunk.

⇒ *Discourages investment*

- Lower Output
- Lower employment and
- Smaller registered sector: *Less registration of the firms*

\- *Increasing worker's bargaining power is equivalent to making the capital owner's property rights more insecure*

- Parameters (firm cut-off size, employer's bargaining power) will determine whether firms chooses
    - inactivity
    - entry into unregistered sector
    - entry into registered sector

- An increase in the labour's bargaining power
    - (i) reduces output, capital formation & employment in the registered manufacturing sector
    - (ii) increases output in the unregistered manufacturing sector
    - (iii) reduces overall manufacturing output.

# EMPIRICAL EVIDENCE

Data for 16 main states in India: 1958-92

- ○ Income (Total, Non-agricultural, Total Manufacturing, Registered and unregistered manufacturing)

- ○ Within registered manufacturing (Employment, Fixed capital, Earnings, Value added per worker)

- ○ Poverty (Urban, Rural)

Regression of the form

$$y_{st} = \alpha_s + \beta_t + \theta r_{st-1} + \xi x_{st} + \varepsilon_{st}$$

$y_{st}$ – variable of interest (typically in logs)

$\alpha_s$ – state fixed effects

$\beta_t$ – year fixed effects

$r_{st}$ – labour regulation variable

$x_{st}$ – exogenous variables of interest

Other controls used are: installed electricity capacity, development expenditures, population, political histories of states.

- Deal with problem of serial correlation by clustering errors state wise

- Results are robust to a number of different ways of running the model and measuring the extent of regulation.
  ○ Results not sensitive to exclusion of West Bengal although the size of the measured effect becomes smaller with the exclusion

Prologue        Djankov et al. (2002)        Role of State        Besley & Burgess (2004)

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# EMPIRICAL MAGNITUDES

- Andhra Pradesh grew at 6% p.a. - the paper predicts that it would have grown at 4.1% if there had been no policy change

  - Without policy change, registered manufacturing output would been 72% higher than its 1990 level
    … urban poverty, 112% of its 1990 level

- West Bengal grew at -1.5% p.a. - the paper predicts 2.2% with no policy reform

  - Without policy change, registered manufacturing output would have been 24% higher than its 1990 level
  - … urban poverty, 89% of its 1990 level

- Overall manufacturing growth: 3% as compared to 2.5%

Prologue          Djankov et al. (2002)          Role of State          Besley & Burgess (2004)

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Table 3: Labor Regulation and Output in India: 1958-1992

|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
|  | Log state output per capita | Log state agricultural output per capita | Log state non-agricultural output per capita | Log state construction output per capita | Log total manufacturing output per capita | Log registered manufacturing output per capita | Log unregistered manufacturing output per capita |
| Method | OLS | OLS | OLS | OLS | OLS | OLS | OLS |
| Labor regulation [t-1] | -0.002 | 0.019* | -0.034* | -0.019 | -0.073** | -0.186*** | 0.086** |
|  | (0.14) | (1.81) | (1.69) | (0.29) | (2.05) | (2.90) | (2.46) |
| State effects | YES | YES | YES | YES | YES | YES | YES |
| Year effects | YES | YES | YES | YES | YES | YES | YES |
| Adjusted $R^2$ | 0.93 | 0.84 | 0.95 | 0.76 | 0.93 | 0.93 | 0.75 |
| Observations | 509 | 509 | 509 | 509 | 509 | 508 | 509 |

Notes: Absolute t statistics calculated using robust standard errors clustered at the state level are reported in parentheses, * significant at 10%, ** significant at 5%, *** significant at 1%. Total, non-agricultural, agricultural, total manufacturing, registered manufacturing and unregistered manufacturing output figures are all components of state domestic product and are expressed in log real per capita terms. State amendments to the Industrial Disputes Act are coded 1=pro-worker, 0=neutral, -1=pro-employer and then cumulated over the period to generate the labor regulation measure. The data are for the sixteen main states for the period 1958 - 1992. Haryana split from the Punjab in 1965 and, after this date, we include Haryana as a separate observation. We therefore have a total of 552 possible observations with deviations accounted for by missing data. See the Data Appendix for details on the construction and sources of the variables.

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Table 4: Labor Regulation and Manufacturing Performance in India: 1958-1992

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Log registered manufacturing output per capita | Log registered manufacturing output per capita | Log registered manufacturing output per capita | Log registered manufacturing output per capita | Log registered manufacturing output per capita | Log unregistered manufacturing output per capita |
| Method | OLS | OLS | OLS | OLS [state time trends] | OLS [no West Bengal] | OLS [no West Bengal] |
| Labor regulation | -0.186*** | -0.185*** | -0.104*** | 0.0002 | -0.105*** | 0.077** |
| [t-1] | (2.90) | (3.65) | (2.67) | (0.01) | (2.59) | (2.25) |
| Log develop expenditure per capita | | 0.240* | 0.184 | 0.241** | 0.208 | 0.492*** |
| | | (1.88) | (1.55) | (2.28) | (1.69)* | (3.39) |
| Log installed electricity capacity per capita | | 0.089 | 0.082 | 0.023 | 0.053 | -0.070 |
| | | (1.47) | (1.51) | (0.69) | (1.21) | (1.11) |
| Log state population | | 0.720 | 0.310 | -1.419 | 0.629 | -3.724*** |
| | | (0.75) | (0.26) | (0.61) | (0.53) | (3.18) |
| Congress majority | | | -0.0009 | 0.020** | -0.002 | 0.017 |
| | | | (0.09) | (2.08) | (0.27) | (0.95) |
| Hard left majority | | | -0.050*** | -0.007 | -0.073* | 0.154* |
| | | | (2.97) | (0.77) | (1.72) | (1.84) |
| Janata majority | | | 0.008 | -0.020 | 0.004 | 0.090** |
| | | | (0.34) | (0.60) | (0.15) | (2.20) |
| Regional majority | | | 0.006 | 0.026 | 0.003 | 0.002 |
| | | | (0.70) | (1.11) | (0.32) | (0.18) |
| State effects | YES | YES | YES | YES | YES | YES |
| Year effects | YES | YES | YES | YES | YES | YES |
| State time trends | NO | NO | NO | YES | NO | NO |
| Adjusted $R^2$ | 0.93 | 0.93 | 0.94 | 0.95 | 0.94 | 0.80 |
| Observations | 508 | 491 | 491 | 491 | 459 | 459 |

Notes: Absolute t statistics calculated using robust standard errors clustered at the state level are reported in parentheses, * significant at 10%, ** significant at 5%, *** significant at 1%. Registered and unregistered manufacturing output are in log real per capita terms. State amendments to the Industrial Disputes Act are coded 1=pro-worker, 0=neutral, -1=pro-employer and then cumulated over the period to generate the labor regulation measure. Log of installed electrical capacity is measured in kilowatts and log development expenditure is real per capita state spending on social and economic services. Congress, hard left, Janata and regional majority are counts of the number of years for which these political groupings held a majority of the seats in the state legislatures. The data are for the sixteen main states for the period 1958 - 1992. Haryana split from the Punjab in 1965 and, after this date, we include Haryana as a separate observation. We therefore have a total of 552 possible observations with deviations accounted for by missing data. See the Data Appendix for details on the construction and sources of the variables.

Table 5: Labor Regulation and Employment, Investment and Productivity in Registered Manufacturing in India: 1958-1992

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Log registered manufacturing employment | Log daily employment in registered manufacturing | Log earnings per worker in registered manufacturing | Log fixed capital per capita | Log number of factories per capita | Log value added per employee |
| Method | OLS | OLS | OLS | OLS | OLS | OLS |
| Labor regulation | -0.072* | -0.285*** | 0.008 | -0.120** | -0.234*** | -0.127** |
| [t-1] | (1.70) | (3.48) | (0.09) | (2.49) | (3.44) | (2.16) |
| Log develop expenditure | 0.076 | 0.327* | 0.207 | 0.594*** | 0.229 | 0.262** |
| per capita | (0.64) | (1.82) | (1.52) | (2.93) | (1.50) | (2.09) |
| Log installed electricity | 0.073 | 0.111 | 0.019 | 0.232* | 0.037 | -0.034 |
| capacity per capita | (1.34) | (1.51) | (0.34) | (1.82) | (0.95) | (0.45) |
| Log state population | -0.099 | 2.122 | 1.116 | -1.130 | 1.18 | -1.19 |
| | (0.09) | (1.14) | (0.93) | (0.61) | (0.42) | (0.81) |
| Congress majority | 0.008 | -0.009 | -0.037* | 0.008 | -0.006 | 0.009 |
| | (0.61) | (0.39) | (1.66) | (0.43) | (0.36) | (0.73) |
| Hard left majority | -0.028 | -0.124*** | 0.0004 | 0.001 | -0.044* | 0.019 |
| | (1.43) | (3.93) | (0.01) | (0.05) | (1.81) | (0.90) |
| Janata | 0.050* | -0.024 | -0.002 | 0.001 | 0.028 | -0.003 |
| Majority | (1.67) | (0.59) | (0.04) | (0.04) | (0.66) | (0.10) |
| Regional majority | 0.007 | 0.018 | -0.003 | 0.0002 | -0.032 | -0.0001 |
| | (0.31) | (0.69) | (0.34) | (0.02) | (1.49) | (0.02) |
| State effects | YES | YES | YES | YES | YES | YES |
| Year effects | YES | YES | YES | YES | YES | YES |
| Adjusted $R^2$ | 0.98 | 0.91 | 0.75 | 0.80 | 0.90 | 0.64 |
| Observations | 516 | 459 | 513 | 515 | 460 | 435 |

Notes: Absolute t statistics calculated using robust standard errors clustered at the state level are reported in parentheses, * significant at 10%, ** significant at 5%, *** significant at 1%. Registered manufacturing employment refers to total employment in factories and daily employment is defined as total worker attendances over a year divided by the total number of days worked by the factory. Earnings per worker is obtained by dividing total annual remuneration by the number of workers. Fixed capital represents the depreciated value of fixed assets owned by the factory on the closing date of the accounting year. The number of factories refers to the number in the registered manufacturing sector in each state where adjustments are made for deregistration and new entrants. Value-added per employee is obtained by deducting the value of total inputs and depreciations from the value of output and dividing this by the number of employees in a factory. State amendments to the Industrial Disputes Act are coded 1=pro-worker, 0=neutral, -1=pro-employer and then cumulated over the period to generate the labor regulation measure. Installed electrical capacity is measured in kilowatts and development expenditure is real per capita state spending on social and economic services. Congress, hard left, Janata and regional majority are counts of the number of years for which these political groupings held a majority of the seats in the state legislatures. The data are for the sixteen main states for the period 1958 - 1992. Haryana split from the Punjab in 1965 and, after this date, we include Haryana as a separate observation. We therefore have a total of 552 possible observations with deviations accounted for by missing data. See the Data Appendix for details on the construction and sources of the variables.

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Table 6 Labor Regulation and Industrial Performance : Dealing with Endogeniety Concerns

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| | Log registered manufacturing output difference | Log unregistered manufacturing output difference | Log registered manufacturing employment difference | Log registered manufacturing output | Log unregistered manufacturing output | Log registered man employ | Labor regulation |
| Method | OLS on matched differences | OLS on matched differences | OLS on matched differences | 2SLS | 2SLS | 2SLS | OLS |
| Labor regulation difference | -0.132*** | 0.310*** | -0.064** | | | | |
| | (5.50) | (8.20) | (2.30) | | | | |
| Labor regulation [t-1] | | | | -0.399*** | 0.117* | -0.370*** | |
| | | | | (4.02) | (1.80) | (3.50) | |
| Mean unionization *post 1977 dummy | | | | | | | 0.095*** |
| | | | | | | | (3.52) |
| Mean non-landlord*post 1977 dummy | | | | | | | -1.422** |
| | | | | | | | (2.48) |
| Match dummies | YES | YES | YES | NO | NO | NO | NO |
| State effects | NO | NO | NO | YES | YES | YES | YES |
| Year effects | YES | YES | YES | YES | YES | YES | YES |
| Over-identification test p-value | | | | 0.98 | 0.99 | 0.78 | |
| F-test instruments(Prob>F) | | | | | | | 7.46 |
| | | | | | | | (0.006) |
| Adjusted $R^2$ | 0.84 | 0.77 | 0.96 | 0.88 | 0.79 | 0.90 | 0.79 |
| Observations | 283 | 283 | 300 | 480 | 480 | 517 | 525 |

Notes: Absolute t statistics calculated using robust standard errors are reported in parentheses, * significant at 10%, ** significant at 5%, *** significant at 1%. For columns (1) - (3) we the average level of union membership (union members divided by population) before 1977 and use these data to match states that experience labor market reforms (pro-worker or pro-employer) with control states based on the level of unionization. We then regress labor regulation on the difference between registered manufacturing in a 'treatment' state and that in its matched 'control' state while also including match dummies in the regression. Standard errors in columns (4) – (6) are clustered at the state level. The two instruments for our lagged [t-1] labor regulation measure are: (i) the pre-1977 unionionization measure interacted with a post-1997 dummy and (ii) the proportion of constituent districts of modern states which operated non-landlord land revenue systems in British India interacted with a post-1977 dummy. The overidentification test we employ is due to Sargan [1958]. The number of observations times the $R^2$ from the regression of the stage two residuals on the instruments is distributed $\chi^2$ (T +1) where T is the number of instruments. State amendments to the Industrial Disputes Act are coded 1=pro-worker, 0=neutral, -1=pro-employer and then cumulated over the period to generate the labor regulation measure. Installed electrical capacity is measured in kilowatts and log development expenditure is real per capita state spending on social and economic services. The data are for the sixteen main states for the period 1958 - 1992. Haryana split from the Punjab in 1965 and, after this date, we include Haryana as a separate observation. We therefore have a total of 552 possible observations with deviations accounted for by missing data. See the Data Appendix for details on the construction and sources of the variables.

Table 7 Labor Regulation and Industrial Performance in India: Industry Level Analysis 1980-1997

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| | Log registered manufacturing output | Log registered manufacturing employment | Log registered fixed capital | Log number factories | Log value added per employee |
| Method | OLS | OLS | OLS | OLS | OLS |
| Labor regulation [t-1] | -0.087*** | -0.060*** | -0.063* | -0.041*** | -0.026** |
| | (3.68) | (3.19) | (1.86) | (2.86) | (2.07) |
| State * industry effects | YES | YES | YES | YES | YES |
| Year effects | YES | YES | YES | YES | YES |
| Industry time trends | YES | YES | YES | YES | YES |
| Adjusted $R^2$ | 0.90 | 0.90 | 0.81 | 0.92 | 0.74 |
| Observations | 21323 | 21323 | 20539 | 21206 | 21254 |

Notes: Absolute t statistics calculated using robust standard errors clustered at the state-industry level are reported in parentheses, * significant at 10%, ** significant at 5%, *** significant at 1%. The data used in the regressions is a panel data set on 3-digit registered manufacturing industries across the sixteen main states of India for the period 1980-1997. The data form an unbalanced panel. Our anlaysis retains state industries which remain in the panel for at least ten years and within these industries we restrict our attention to firms which employ more than a hundred workers to get around the problem of smaller firms being excluded from the sample to maintain confidentiality. Using this a definition we have total of 101 3-digit industries in our panel with an average of 68 in a each state. State amendments to the Industrial Disputes Act are coded 1=pro-worker, 0=neutral, -1=pro-employer and then cumulated over the period to generate the labor regulation measure. The regressions include 3-digit industry time trends to help control for the possibility that industries experience different rates of technological change. See the Data Appendix for details on the construction and sources of the variables.

Table 8 Labor Regulation and Poverty in India: 1958-1992

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| | Overall headcount | Urban headcount | Rural headcount | Urban headcount | Urban headcount | Urban headcount | Urban headcount |
| Method | OLS | OLS | OLS | OLS | OLS [state time trends] | OLS [survey years only] | OLS [no West Bengal] |
| Labor regulation[t-1] | -0.008 | 2.288*** | -0.821 | 2.070** | -0.270 | 2.251** | 1.916** |
| | (0.01) | (3.31) | (0.48) | (2.52) | (0.30) | (2.52) | (1.99) |
| Log develop expenditure per capita | | | | -3.468 | -0.983 | -2.900 | -4.044 |
| | | | | (0.82) | (0.32) | (0.79) | (0.94) |
| Log installed electricity capacity per capita | | | | 0.242 | 1.260 | 1.058 | 0.875 |
| | | | | (0.28) | (1.60) | (1.02) | (1.27) |
| Log state population | | | | -5.448 | 38.74 | -3.717 | -10.42 |
| | | | | (0.29) | (1.28) | (0.19) | (0.56) |
| Congress majority | | | | 0.418** | 0.206 | 0.464** | 0.452** |
| | | | | (1.98) | (0.63) | (2.36) | (1.99) |
| Hard left majority | | | | 0.508* | -0.083 | 0.501 | 0.306 |
| | | | | (1.76) | (0.21) | (1.46) | (0.39) |
| Janata majority | | | | 0.518 | 0.819 | 0.326 | 0.557 |
| | | | | (1.14) | (1.28) | (0.73) | (1.19) |
| Regional majority | | | | 0.463*** | 0.439 | 0.504*** | 0.487*** |
| | | | | (2.86) | (0.90) | (2.76) | (2.86) |
| State effects | YES | YES | YES | YES | YES | YES | YES |
| Year effects | YES | YES | YES | YES | YES | YES | YES |
| Adjusted $R^2$ | 0.83 | 0.88 | 0.80 | 0.89 | 0.91 | 0.87 | 0.89 |
| Observations | 547 | 547 | 547 | 518 | 518 | 311 | 485 |

Notes: Absolute t statistics calculated using robust standard errors clustered at the state level are reported in parentheses, * significant at 10%, ** significant at 5%, *** significant at 1%. Poverty headcount is the percentage of the population below the official Indian poverty lines which are separately defined for rural and urban areas. In column (4) the rural-urban poverty difference is the difference between the rural and urban headcount measures for each state. In column (7) we only include data for years when National Sample Surveys were carried out. State amendments to the Industrial Disputes Act are coded 1=pro-worker, 0=neutral, -1=pro-employer and then cumulated over the period to generate the labor regulation measure. Installed electrical capacity is measured in kilowatts and development expenditure is real per capita state spending on social and economic services. Congress, hard left, Janata and regional majority are counts of the number of years for which these political groupings held a majority of the seats in the state legislatures. The data are for the sixteen main states for the period 1958 - 1992. Haryana split from the Punjab in 1965 and, after this date, we include Haryana as a separate observation. We therefore have a total of 552 possible observations with deviations accounted for by missing data. See the Data Appendix for details on the construction and sources of the variables.

*"The aim of every political Constitution, is or ought to be, first to obtain for rulers men who possess most wisdom to discern, and most virtue to pursue, the common good of society; and in the next place, to take the most effectual precautions for keeping them virtuous whilst they continue to hold their public trust."*

*James Madison in Federalist Papers (#57)*