
Reforms, Entry and Productivity:

Some evidence from the Indian Manufacturing Sector

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Entry: Appeal

- Growth:
 - Productivity
 - Private ownership of productive assets
 - Competition

 - Problems with private ownership
 - Theory
 - Agency costs
 - Empirical evidence
 - Mixed at best
 - Has a positive impact on productivity only in the presence of “appropriate” institutions

 - Competition
 - By and large, leads to improvement of production and x- efficiencies
 - Jovanovic and Lach, 1989; Geroski, 1995; Nickell, 1996; Stennek, 2000
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Barriers to entry:

The traditional view

- Increasing returns to scale
 - Bain, 1956

 - Sunk costs
 - Incumbents have to take contestability of the market into account if the magnitude of sunk cost is high
 - Eaton and Lipsey, 1980; Baumol, Panzar and Willig, 1982
 - Incumbents can use sunk costs as a strategic tool to deter entry
 - Schmalensee, 1978; Dixit, 1980; Geroski and Murfin, 1991

 - Access to (or cost of) capital
 - Evans and Jovanovic, 1989

 - Long term contracts
 - Hart and Tirole, 1990; Bolton and Whinston, 1991, 1993
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The traditional view: Empirical implications

- Context: Chile

- Tybout (1997)

- Explanatory variables

- Growth rate of real output of industry + ✓
- Industry concentration (Herfindahl) - ✓
- Import penetration -
- Capital-output ratio +

- Controls

- Industry (dummy variables)
 - Time/year (dummy variables)
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Barriers to entry: The institutional view

- De Soto (1989)
 - Djankov et al. (2002)
 - Entry costs are fairly high in most countries
 - Regulatory barriers are likely to be more prevalent in countries that do not have democratically elected governments
 - Regulations as a means to seek rent (Shleifer and Vishny, 1993)
 - Perotti and Volpin (2004)
 - Incumbents can successfully lobby in favour of entry barriers because they can credibly promise to share rent while new entrants can only hope to earn normal profits
 - Klapper, Laeven and Rajan (2005)
 - Regulations (particularly detrimental to small firms)
 - Capital market imperfections
 - Property rights
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Research plan

- Goal

- Control for variations in the *de jure* nature of the regulations and formal institutions, such that the impact of *de facto* variations in the implementation of these regulations and the functioning of these institutions on entry can be captured
 - Context: India

- Questions

- What explains net entry rates in the context of emerging market?
 - Industry-level factors
 - State-level factors
 - Does net entry have a positive impact on tfp growth?
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Context: India

- 1980-84
 - Balance of payments crisis and IMF bailout
 - Major textile strike in 1982, with spillover for other industries
 - Militancy and Operation Bluestar in 1982
 - Indira Gandhi assassinated in October 1984

 - 1985-91
 - Rajiv Gandhi initiated New Economic Policy
 - A year of political instability following changes in affirmative action policy in August 1990
 - Rajiv Gandhi assassinated in May 1991
 - Acute balance of payments crisis in 1991

 - 1992-97
 - Congress party comes back to power with Narasimha Rao heading a minority government
 - Initiation of sweeping economic reforms
 - GDP growth exceeds 6% three years in succession
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Pillars of industrial policy in India

- Licensing policy
 - Reservation policy
 - Monopoly Regulation and Trade Practices Act
 - Import substitution
 - Foreign Exchange Regulation Act
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Reforms in India:

Brief review of the literature [1]

- Rodrik and Subramanian (2005)

- Pro-incumbent policies in the 1980s

- Capital limits for “business houses” and small scale sector redefined
- Abolition of licensing requirement for units set up in backward areas
- Incumbents could set up new units without restriction on size if they were 100% export oriented
- Access to foreign technology linked to export performance
- Import tariffs reduced for capital goods and kept high for final goods
- Enactment of Sick Industrial Companies Act in 1985

- Pro-competition policies in the 1990s

- Licensing policy abolished
 - Majority shareholding by MNEs
 - Removal of administered pricing regime
 - Reduction of import tariffs and non-tariff barriers across the board
 - Financial sector reforms
 - Capital account liberalization and abolition of FERA
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Reforms in India:

Brief review of the literature [2]

- Besley and Burgess (2004)
 - Considerable variation in accountability of state governments

 - Kochhar et al., forthcoming; Aghion et al., 2005
 - Institutional factors play a greater role in explaining inter-regional variation in growth/economic performance in the 1990s than in the 1980s

 - Datt and Ravallion, 1998
 - Considerable inter-state variation in human resources
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Implications for empirical strategy

- Regression model:

$$\Delta N_{ij} = \alpha + \sum_{i=m} \beta_i X_{ij} + \sum_{j=n} \gamma_j Z_{ij} + e_{ij}$$

- Industry level variables (X)

- Growth of industry
- Technology
- Industry competition
- Number of incumbent firms

- State level variables (Z)

- Economic growth
 - Nature of democracy
 - Labour
 - Industrial legacy
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Data: Annual Survey of Industries

- Advantages:
 - Annual
 - Coverage includes value added, capital, employment, etc
 - Usage
 - Hasan, Mitra and Ramaswamy, 2003; Besley and Burgess, 2004; Aghion, Burgess and Zilibotti, 2004; Aghion et al., 2005; Lall and Charavorty, 2005; Kochhar et al., forthcoming

 - Disadvantage:
 - Plant level (as opposed to firm level) data
 - Plants not linked by unique id over time
 - Coverage

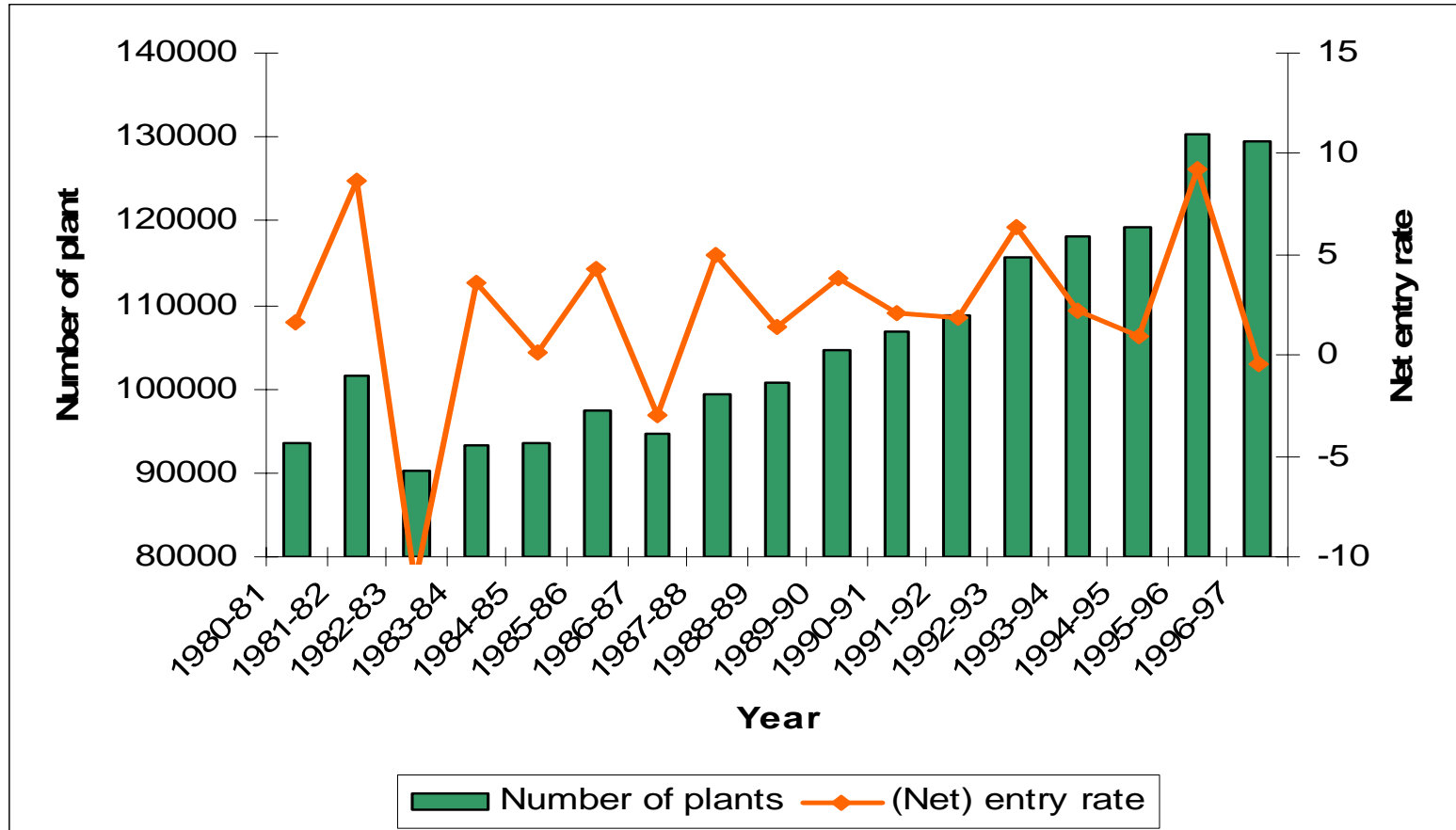
 - Defence:
 - Bartelsmann, Haltiwanger and Scarpetta, 2004
 - 3-digit industry level analysis
 - Measure of net entry linear monotonic transformation of “true” net entry under fairly weak assumptions
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Measurement of variables

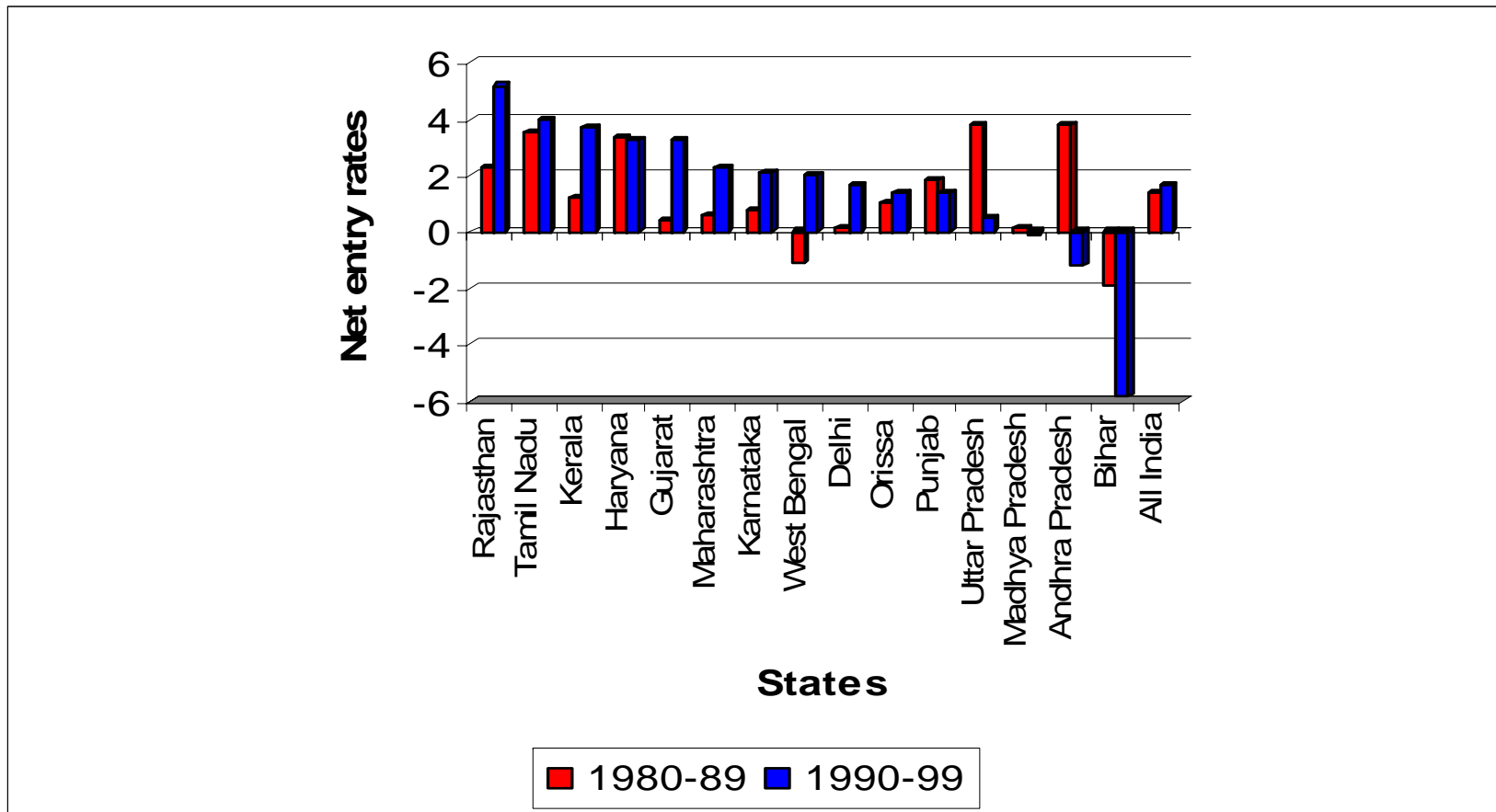
- Industry level variables
 - Growth rate of value added
 - Capital-labour ratio
 - 4-plant concentration ratio
 - Initial number of plants

 - State level variables
 - Growth rate of state GDP
 - Per capita expenditure on health
 - Proportion of years during which a regional party was in power
 - Literacy rate
 - Number of man-days lost per worker, on account of industrial action
 - Initial share of manufacturing in state GDP
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Net entry rates: Variation over time



Net entry rates: Variation across states



Determinants of Net Entry: Industry level factors

	1984-91		1992-97	
Industry growth rate	3.54 **	3.15 **	0.74 **	1.03 **
Capital-output ratio	2.49	1.77	3.84 *	3.44
4-firm concentration ratio	0.08	0.12	- 0.19 **	- 0.27 ***
Initial number of plants	0.34	0.34	0.04	0.04
Constant	- 28.72 **	- 28.32 **	- 2.77	- 1.37
Industry controls	No	Yes ***	No	Yes *
<i>Adjusted R-square</i>	<i>0.191</i>	<i>0.187</i>	<i>0.032</i>	<i>0.037</i>
<i>Number of observations</i>	<i>1650</i>	<i>1650</i>	<i>1560</i>	<i>1560</i>

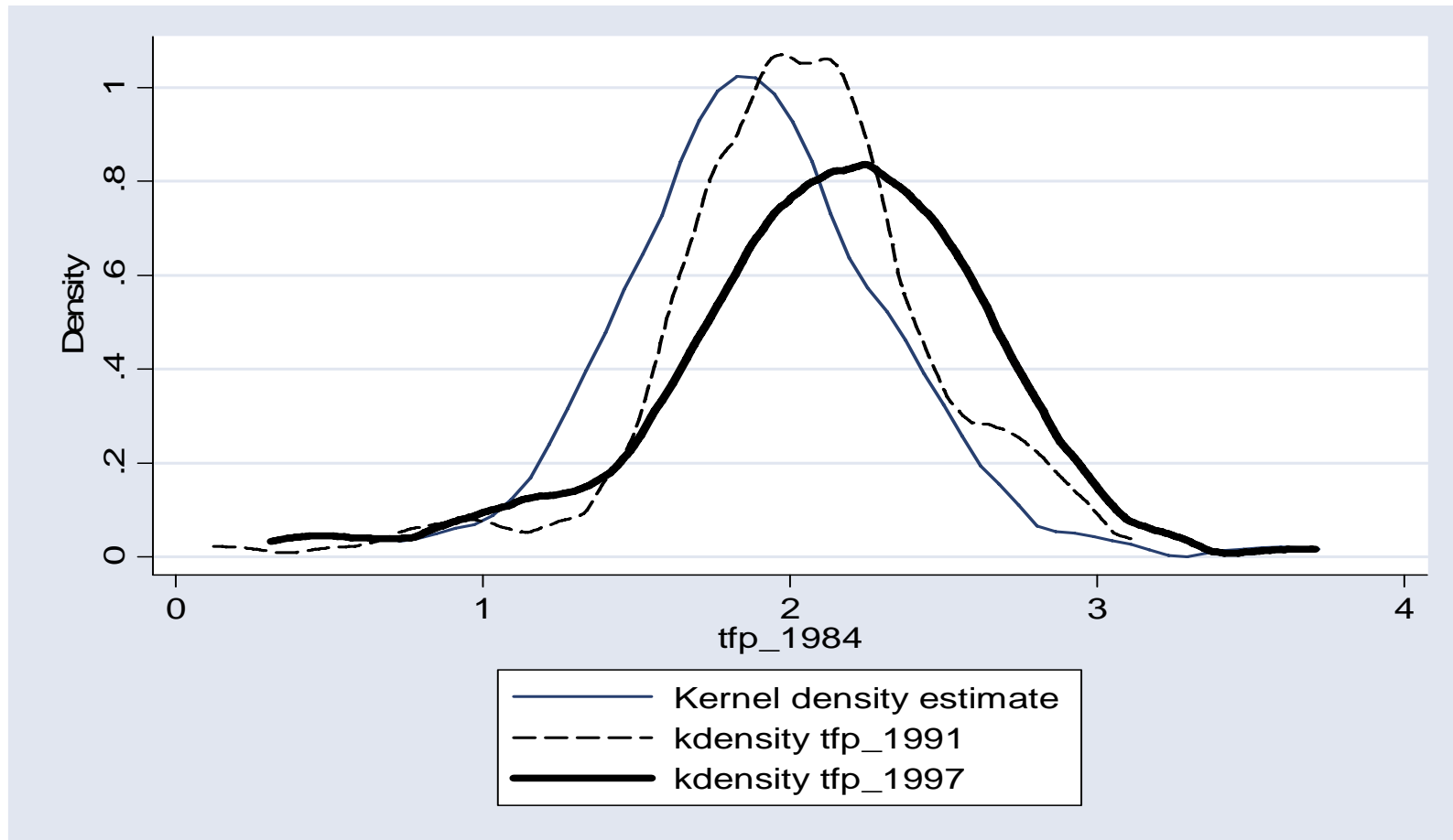
Determinants of Net Entry: State level factors

	1984-91			1992-97		
HDI	- 18.91			33.76 *		
T&D loss		0.53			- 0.31 *	
Man-days lost	58.84 *	55.98 *	59.37 *	11.61	23.99	3.61
Literacy rate			- 0.09			0.43 **
PC health expenditure			- 0.09			- 19.53 **
Manufacture % SGDP			53.58			48.23 **
Growth of SGDP			3.43			0.13
Regional political party	6.04	4.78	- 1.96	- 1.93	- 1.86	- 3.62
Industry level variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes ***	Yes ***	Yes ***	Yes *	Yes *	Yes *
Adjusted R-square	0.195	0.194	0.196	0.039	0.037	0.041

Total factor productivity: Estimation

- Estimated at 3-digit industry level
 - Olley and Pakes (1996) algorithm
 - Coefficient estimates
 - 1984-91
 - Labour: 0.5272; Capital: 0.3646
 - 1992-97
 - Labour: 0.5232; Capital: 0.3637
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Total factor productivity: Distribution across industries



Impact of entry on tfp growth: Fixed effects

	(1)	(2)	(3)	(4)
Net entry rate	0.3530 ***	0.3577 ***	0.3768 ***	0.4199 ***
Net entry rate [-1]			- 0.1864 ***	- 0.1978 ***
Net entry rate [-2]				0.0320
Dummy for 1985-89		- 0.0321	- 0.0370	- 0.0491
Dummy for 1992-97		0.0665 *	0.0703 *	0.0667
Constant	- 0.0035	- 0.0131	- 0.0124	- 0.0162
<i>LR chi-square</i>	<i>42.72 ***</i>	<i>49.06 ***</i>	<i>58.04 ***</i>	<i>57.77 ***</i>
<i>Number of observations</i>	<i>1786</i>	<i>1786</i>	<i>1672</i>	<i>1465</i>
<i>Number of industries</i>	<i>130</i>	<i>130</i>	<i>130</i>	<i>130</i>

Impact of entry on tfp growth: Generalised method of moments

	(1)	(2)	(3)	(4)
Net entry rate	0.2750 **	0.2838 **	0.1985 **	0.2780 **
Net entry rate [-1]			- 0.0727	0.0466
Net entry rate [-2]				0.1563
Dummy for 1985-89		- 0.0378	- 0.0216	- 0.0501
Dummy for 1992-97		0.0627 *	0.0782 **	0.0512
Constant	- 0.0008	- 0.0084	- 0.0209	- 0.0048
<i>F-statistic</i>	5.30 **	4.64 ***	3.66 **	2.67 **
<i>Number of observations</i>	1786	1786	1675	1563
<i>Number of industries</i>	130	130	130	130

Conclusions

- Net entry during 1984-91 driven largely by industry growth rate and unobserved industry level variables; state level variables largely insignificant

 - Net entry during 1992-97 correlated with strategic industry level variables and state level variables
 - Legacy
 - Human resources
 - Accountability of government

 - Growth of tfp positively related to net entry rate
 - No impact of 1985-89 reforms
 - Positive impact of 1992-97 reforms
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