Trade, Management, and Firm Productivity: Evidence from India

Ananya Kotia December 19, 2024

Reform 000 Data and Identification 000000 Event Studies

Theoretical Framework 000000

Competition and Productivity

"There is a perennial paper in the productivity literature which presents the following result: firms that are in more competitive markets are more efficient." – Backus (2020)

Reform 000 Data and Identification

Event Studies

Theoretical Framework 000000

Competition and Productivity

"There is a perennial paper in the productivity literature which presents the following result: firms that are in more competitive markets are more efficient." – Backus (2020)

- · Literature emphasizes selection: competition drives out laggard firms
- Competition may also push firms to boost within-firm productivity

Reform 000 Data and Identification

Event Studies

Theoretical Framework 000000

Competition and Productivity

"There is a perennial paper in the productivity literature which presents the following result: firms that are in more competitive markets are more efficient." – Backus (2020)

- · Literature emphasizes selection: competition drives out laggard firms
- · Competition may also push firms to boost within-firm productivity
- This project: relationship between competition and firm productivity in the context of firms in a developing country adapting to globalization
- Focus on a specific mechanism: management structures governance, and top managerial appointments in Indian family firms

Event Studies

The Predominant Form of Corporate Governance in Developing Countries: Family Firms

EXHIBIT 1 | Family Businesses Are More Prevalent Among Top Companies in Emerging Markets



- Exclude multinationals: 70% of large firms in India are family-controlled
- 90% of these businesses in India are directly managed by family
- Family firms often lack robust governance frameworks
 - \implies stand to gain the most from professional management

Introduction	Reform	Data and Identification	Event Studies	Theoretical Framework
0000	000	000000	0000000	

Question

Does competition from imports induce firms in developing countries to bring in professional managers for greater efficiency?

Not today: does this change have a meaningful impact on aggregate TFP?

0000

Data and Identification

Event Studies

Theoretical Framework 000000

This Paper



0000

Data and Identification 000000 Event Studies

Theoretical Framework 000000

This Paper



0000

Data and Identification 000000 Event Studies

Theoretical Framework 000000

This Paper



0000

Data and Identification 000000 Event Studies

Theoretical Framework 000000

This Paper



0000	

Data and Identification 000000 Event Studies

Theoretical Framework 000000

This Paper



0000	

Data and Identification

Event Studies

Theoretical Framework 000000

This Paper

Product-specific import competition shock: affected > 1/3 of Indian manufacturing



Related Literature

0000	

Data and Identification 000000

Event Studies

Theoretical Framework 000000

This Paper



0000	

Data and Identification

Event Studies

Theoretical Framework 000000

This Paper

Product-specific import competition shock: affected > 1/3 of Indian manufacturing



Related Literature

Reform

Data and Identification

Event Studies

Theoretical Framework

Reform

Data and Identification

Event Studies

Theoretical Framework

Data and Identification 000000 Event Studies

Theoretical Framework 000000

A Brief History of India's Trade Reforms

Pre 1991: Comprehensive import licensing after a BOP crisis in 1956-57

- 1991: Broad-based IMF-imposed economic reforms
 - Ease tariffs and NTBs on intermediate goods
 - Topalova (2010), Goldberg et al. (2009), De Loecker et al. (2016)
 - Muddled with many domestic reforms!
- 1990s: Consumer good imports remained unilaterally banned
 - 30% of all tariff lines
 - Allowed under GATT rules on weak BOP grounds
 - 2001: WTO-mandated removal of consumer good QRs
 - After complaints from several member countries

Event Studies

Theoretical Framework 000000

Impact of QR Removal on Product-Level Imports



Note: • FEs: year, 6-digit product, 4-digit product × year

- + Later: new 8-digit product-level \times country of origin data
- · Later: PPML

 Introduction
 Reform
 Data and Identification
 Event Studies
 Theoretical Framework

 0000
 00●
 000000
 0000000
 000000
 000000

No Impact on Exports \rightarrow Isolate Impact of Import Competition



Note: • FEs: year, 6-digit product, 4-digit product × year

- + Later: new 8-digit product-level \times country of origin data
- Later: PPML

Reform

Data and Identification

Event Studies

Theoretical Framework

Reform 000 Data and Identification

Event Studies

Theoretical Framework 000000

Data Construction

Firm Balance Sheet Panel Data (Prowess)

Reform

Data and Identification 000000 Event Studies

Theoretical Framework 000000

Data Construction



Data and Identification

Event Studies

Theoretical Framework 000000

Data I: A Novel Dataset of Product-level QRs in India



असाधारण EXTRAORDINARY

Re Carrier

MINISTRY OF COMMERCE

NOTIFICATION NO. 3 (RE-98)/97-02

New Delhi, the 13th April, 1998

S.O. 31(E).—In evertise of the powers conferred by section 5 of the Foreign Trade (Development and Regulation) Art (1992; Development and Regulation) Art (1992; Development (1992; Development) (1997; Dev

Exim Code	Item Description	Policy	Conditions relating to the Policy	Import under SIL/Public
03061301	Shrimp (scampi) macrobactium frozen	Free		
03061302	AFD sl:rimp frozen	Free		
03061303	Prawns frozen	Free		
03061400	Crabs	Free		
03061900	Other, including flours, meals and	Free		
	pellets of crustaceans, fit for human			

Source: Archives, Indian Ministry of Commerce and Industry

Reform

Data and Identification 000000 Event Studies

Theoretical Framework 000000

Data Construction



Event Studies

Theoretical Framework 000000

Data II: Matched Firm-Manager Data

Company	Name	Executive Member	Sex	Father's Name
COSCO (INDIA) LTD	A JAIN	1	М	D K JAIN
COSCO (INDIA) LTD	M JAIN	1	М	D K JAIN
COSCO (INDIA) LTD	P JAIN	1	М	D K JAIN
COSCO (INDIA) LTD	V K SOOD	0	М	H R SOOD
COSCO (INDIA) LTD	D K JAIN	1	М	K L JAIN
COSCO (INDIA) LTD	N K JAIN	1	М	K L JAIN
COSCO (INDIA) LTD	N JAIN	1	М	N K JAIN
COSCO (INDIA) LTD	M P GUPTA	0	М	P D GUPTA
COSCO (INDIA) LTD	S SHARMA	0	М	R K SHARMA
COSCO (INDIA) LTD	R JAIN	0	F	S RAJ
COSCO (INDIA) LTD	M L MANGLA	0	М	T CHAND

Note: First and middle names abbreviated for clarity.

Reform

Data and Identification

Event Studies

Theoretical Framework 000000

Data Construction



Data and Identification

Event Studies

Theoretical Framework 000000

Data III: Novel Product Concordances

Prowess Products		r	TC HS Products	Industry	
3008040800	Sunflower seed oil	15101010	Sunflower oil edible grade	15140	Manufacture of vegetable
3008040804	Sunflower seed oil, refined	13121910	Sufficience of earbie grade	10142	corn oil.
4012080400	Suitcases	420212.04	Plastic moulded suit-cases	19121	Manufacture of travel goods like suitcases, bags and holdalls etc.
5024200404	Distempers	321000.01	Distempers	24222	Manufacture of paints, varnishes, enamels or lacquers.
6308361216	- Washing Machines/Laundry Mach	84501100	Fully - automatic washing machines (upto 10kg)	- 29308	Manufacture of other electric domestic appliances n.e.c.: dishwashers, household type laundry equipment, electric razors including parts and accessories for electrical domestic appliances
		84501200	Other washing machines with built-in centrifugal drier (upto 10kg)		
		84501300	Other washing machines (up to 10kg)		

 > 2700 HS products mapped to > 6000 Prowess products and 400 industries < Back

Reform

Data and Identification

Event Studies

Theoretical Framework 000000

Data Construction



Event Studies

Theoretical Framework 000000

Unusually Narrow Scope of the 2001 Trade Reform

- Variation in import competition across the product space and time
- Externally imposed: hinged on IMF technical assessment of India's BoP
- No concurrent domestic deregulation \rightarrow isolate trade reform impact
- No change export policy \rightarrow isolate import competition impact
- Affected mostly consumer goods: limited impact on firms' input costs

Data and Identification

Event Studies

Theoretical Framework 000000

Event-study Design

$$Y_{it} = \sum_{k=\underline{T}}^{\overline{T}} heta_k D_{it}^k + \delta_i + \lambda_{jt} + arepsilon_{it}$$

- $D_{it}^k = 1$ if import restrictions on highest-revenue product of firm i are removed in year t
- Tag a firm as treated based on its highest revenue product
- λ_{jt} : year \times industry FE

Identification assumption: in the absence of the QR removal, firms that operate in product markets that were exposed to import competition should have had similar paths of outcome variables as compared to firms in other sectors (parallel trends).

Reform

Data and Identification

Event Studies

Theoretical Framework

Data and Identification

Event Studies

Theoretical Framework 000000

Impact on Revenues and Profits



Data and Identification

Event Studies

Theoretical Framework 000000

Firms Professionalize Management on Exposure to Competition



- Note: Sample: firms that report at least one family manager before treatment
 - · Controls: firm age and total board size
 - Pre-shock control group mean = 0.60



Professionalization \Longrightarrow **Replacing Family Managers w/ Outsiders**



Note: • Sample: firms that report at least one family manager before treatment

- Controls: firm age and total board size
- Pre-shock control group mean = 1.30 for family managers, 0.50 for non-family managers

Firms that Professionalize Report Higher Productivity



Data and Identification 000000 Event Studies

Theoretical Framework 000000

Firms that Professionalize Report Higher Productivity



Data and Identification

Event Studies

Theoretical Framework 000000

Which Firms Delegate?



Data and Identification

Event Studies

Theoretical Framework 000000

Taking Stock

- 1. Import competition leads firms to shed family managers
- 2. Least productive firms select into delegation

Is this a good thing? Two unique datasets help answer (but not today):

- Matched Firm-Manager Data: Track 6.5M managers and directors
 - Do fired managers find new roles? Is their talent in demand?
 - Experience: on boards of other firms
 - links to multinationals or exporting firms
 - Networks: links to firms in upstream/downstream industries, financial firms
- Data on Board Meetings:
 - Data on all board meetings of Prowess firms (1995-present)
 - Use LLMs to analyze how new managers shift the focus of board decisions
 - Reveal further mechanisms: *how* professional managers drive decisions on productivity, efficiency, and firm strategy

Reform

Data and Identification

Event Studies

Theoretical Framework

Data and Identification

Event Studies

Theoretical Framework ●00000

Theoretical Framework: Goal

- Proximate goal: explain why firms delegate to professional management only after exposure to import competition
 - Reminiscent of Leibenstein (1966)'s idea of "X-efficiency"
 - "absent competitive pressure, firms may not use their resources efficiently"
 - Strong criticism by advocates of neoclassical price theory, particularly Stigler
 - ... X-inefficiency meant the assumption of profit maximization had to be replaced. For that mistake, Leibenstein had to be rebuked (Perelman (2011))
 - · Cannot be explained by standard trade models
- · Later (not today): quantitative exercise
 - Are trade-induced changes in management and within-firm productivity meaningful in the aggregate?

Model Overview

Reform 000 Data and Identification

Event Studies

Theoretical Framework 0●0000

- A static model of industry equilibrium with heterogeneous firms
- **Managerial delegation takes center stage:** firms face a choice between family management and delegation to outside professionals



• Adaptation of endogenous growth models with technology diffusion: Moll and Lucas (2014), Perla and Tonetti (2014), Perla, Tonetti, and Waugh (2021).

000	

Data and Identification

Event Studies

Theoretical Framework

Environment

- · Closed economy with monopolistic competition
- Final good: CES aggregate of N intermediates: $Y = \left(\sum_{i=1}^{N} y_i^{\frac{\sigma-1}{\sigma}}\right)^{\frac{\sigma}{\sigma-1}}$

~	 0	

Data and Identification

Event Studies

Theoretical Framework

Environment

- Closed economy with monopolistic competition
- Final good: CES aggregate of N intermediates: Y =

$$= \left(\sum_{i=1}^{N} y_i^{\frac{\sigma-1}{\sigma}}\right)^{\frac{\sigma}{\sigma-1}}$$

- Firms produce unique intermediate varieties
 - Pay entry fixed cost to draw φ from a Pareto distribution G
 - Technology: constant MC with a fixed overhead cost: $\ell = w(f + y/\varphi)$

• Prices:
$$p^* = rac{\sigma}{\sigma-1} \cdot rac{w}{\omega}$$

• Monetary Profits:
$$\pi = A\varphi^{\sigma-1} - wf$$
 (where $A = \frac{1}{\sigma} \left(\frac{\sigma-1}{\sigma} \right) Y P^{\sigma}$)

0000	

Data and Identification

Event Studies

Theoretical Framework 00●000

Environment

- Closed economy with monopolistic competition
- Final good: CES aggregate of N intermediates: $Y = \left(\sum_{i=1}^{N} y_i^{\frac{\sigma-1}{\sigma}}\right)^{\frac{\nu}{\sigma-1}}$
- Firms produce unique intermediate varieties
 - Pay entry fixed cost to draw φ from a Pareto distribution G
 - Technology: constant MC with a fixed overhead cost: $\ell = w(f + y/\varphi)$

• Prices:
$$p^* = rac{\sigma}{\sigma-1} \cdot rac{w}{\omega}$$

- Monetary Profits: $\pi = A\varphi^{\sigma-1} wf$ (where $A = \frac{1}{\sigma} \left(\frac{\sigma-1}{\sigma} \right) Y P^{\sigma}$)
- Exit: firms with $arphi < arphi_e^*$ exit
 - + Productivity distribution of active firms: $G(\varphi \mid \varphi > \varphi_e^*)$

0000	

Data and Identification

Event Studies

Theoretical Framework 00●000

Environment

- Closed economy with monopolistic competition
- Final good: CES aggregate of N intermediates: $Y = \left(\sum_{i=1}^{N} y_i^{\frac{\sigma-1}{\sigma}}\right)^{\frac{\nu}{\sigma-1}}$
- · Firms produce unique intermediate varieties
 - Pay entry fixed cost to draw φ from a Pareto distribution G
 - Technology: constant MC with a fixed overhead cost: $\ell = w(f+y/arphi)$

• Prices:
$$p^* = \frac{\sigma}{\sigma-1} \cdot \frac{w}{\omega}$$

- Monetary Profits: $\pi = A\varphi^{\sigma-1} wf$ (where $A = \frac{1}{\sigma} \left(\frac{\sigma-1}{\sigma} \right) Y P^{\sigma}$)
- Exit: firms with $\varphi < \varphi_e^*$ exit

- Productivity distribution of active firms: $G(\varphi \mid \varphi > \varphi_e^*)$

Firm's profits =
$$\begin{cases} \pi(\varphi), & \text{if firm does not delegate} \\ \mathbb{E}\left[\pi\left(\varphi'\right) \mid \varphi' > \varphi_e^*\right] - wf_d, & \text{if firm delegates} \\ 0, & \text{if firm exits} \end{cases}$$

00		

Data and Identification

Event Studies

Theoretical Framework 000●00

Delegation Decision

- Pay fixed cost f_m to delegate
- Random draw φ' from the distribution of active firms, $G(\varphi \mid \varphi > \varphi_e^*)$
- Once delegated, cannot revert to family management

Delegation Threshold

$$\pi(\varphi_d^*) = \mathbb{E}\left[\pi(\varphi') \mid \varphi' > \varphi_e^*\right] - w f_d$$
$$\implies \left(\varphi_d^*\right)^{\sigma-1} = \left(\varphi_e^*\right)^{\sigma-1} \left(\lambda - \frac{f_d}{f}\right) \tag{1}$$

where $\lambda = \frac{\gamma}{\gamma - (\sigma - 1)} > 1$ is a constant. γ : Pareto shape parameter.

- + $arphi_d^* > arphi_e^*$ as long as the cost of delegation is not too large: $f_d/f < \lambda 1$
- Firms with $arphi \in (arphi_e^*, arphi_d^*)$ choose to delegate lacksquare Delegation Probability
- Even if $f_d = 0$, the most productive firms will choose not to delegate

 Introduction
 Reform
 Data and Identification
 Event Studies
 Theoretical Frame

 0000
 000
 000000
 000000
 000000
 000000
 000000
 000000
 000000
 000000
 000000
 000000
 000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 0000000
 00000000
 0000000
 0000000</t

Delegation and Change in Aggregate Demand



Event Studies

Conclusion

- How competitive pressures from globalization induce changes within organizations
- Large, product-specific import competition shock + novel data on firm organization
- Indian family firms respond to import exposure by replacing family managers with outside professionals
- Suggestive evidence: such firm reorganization is productivity enhancing
- Theoretical framework: selection into managerial delegation

Thank you!

Related Literature

- Competition and firm productivity: Hicks (1935); Leibenstein (1966); Nickell (1996); Schmidt (1997); Acemoglu, Aghion, and Zilibotti (2006); Holmes and Schmitz (2010); Van Reenen (2011); Backus (2020)
- **Trade and within-firm productivity:** Topalova and Khandelwal (2010); Lileeva and Trefler (2010); Atkin and Khandelwal (2017); Bustos (2011); Bloom et al. (2016); Hombert and Matray (2018); Autor et al. (2020)
- Family firms: Bertrand and Mullainathan (2002); Burkart, Panunzi, and Shleifer (2003); Bertrand and Schoar (2006); Khanna and Yafeh (2007); Bloom and Van Reenen (2007); Lemos and Scur (2019); Caselli and Gennaioli (2013); Lemos and Scur (2018); Akcigit, Alp, and Peters (2021)
- **Trade and organizations:** Caliendo and Rossi-Hansberg (2012); Chen and Steinwender (2021)

■ Back

85: Electrical machinery

- 8517: Telephone sets and other apparatus for voice transmission
 - 861711: Line telephone sets
 - 85171110: Push button type
 - 85171120: Rotary dial type
 - 85171130: Cordless Telephones
 - 861712: Cellular network sets
 - 85171210: Push button type
- 8525: Transmission apparatus and cameras
 - 852550: Transmission apparatus
 - 85255010: Radio broadcast transmitter
 - 85255020: TV broadcast transmitter
 - 85255040: Jamming equipment
 - 852580: Cameras
 - 85258010: Television Cameras
 - 85258020: Digital cameras
 - 85258030: Video cameras recorders

Policy Timeline
 Identification

"The commerce secretary had written to me to say that they intended to make a case for continuing with QRs on consumer goods for BOP reasons, and he wanted confirmation of support from the Ministry of Finance. I promptly wrote back to say that it would be against our national interest because it painted a picture of helplessness that was completely contrary to what we in the Ministry of Finance were projecting to foreign investors."

Excerpt from "Backstage: The Story behind India's High Growth Years, Montek Singh Ahluwalia"

◀ Back

Removal of quantitative restrictions on all imports to transform Indian market

Removal of quantitative restrictions on all imports will transform the Indian market like never before.



PROFUSION OF CHOICE: Shelves like these in a Chennai super store are getting stacked with an array of foreign products

Amma Naana Super Store, TTK Road, Chennai: Heinz spaghetti with sausages in tomato sauce, 220 g for Rs 155; H-Vollmilch low-fat milk with one-year shelf life, 1 litre for Rs 66; Sugar-free chocolate biscuits, 184 g for Rs 98...

Rustom Stores, Colaba, Mumbai: Blue Bunnyice cream, 1.5 litre for Rs 425; St Martin's iced tea, 240 ml for Rs 25; Langnese honey, 500 g for Rs 165

Steak House, Jor Bagh, Delhi: Lake land mayonnaise, 450 g for Rs 98; Laughing Cow cheese, 180 g for Rs 45...

A sample of goodies on the shelves of stores in the three metros on April 3, two days after India abolished all quantitative restrictions (QRs) on imports. On payment of customs duty, anybody can now import any amount of any product. A freedom of economic choice that comes a full 54 years after the freedom of political choice the country attained in 1947.

Source: India Today Magazine, April 16, 2001.

Data I: A Novel Dataset of Product-level QRs in India



असाधारण EXTRAORDINARY

at alignar

MINISTRY OF COMMERCE

NOTIFICATION NO. 3 (RE-98)/97-02

New Delhi, the 13th April, 1998

S.O. 31(E).—In evertise of the powers confirred by section 5 of the Foreign Trade (Development and Regulation) Are, 1992 (b): 22 of 1992 read with paragraph 4.1 of Export and Import Policy, Port2002, the Cettal Government Interby makes the following amendanents in the ITC (H5) Classifications of Export and Import Items, 1997-2002, published on 31 st March, 1997 and is amended from time to time. In respect of following Exm Code Nos, policy indicated in columns 3,4 and 5-shall be amended for end as under.

Exan Code	Item Description	Policy	Conditions relating to the Policy	Import under SIL/Public
03061301	Shrimp (scampi) macrobactium frozen	Free		
03061302	AFD shrimp frozen	Free		
03061303	Prawns frozen	Free		
03061400	Crabs	Free		
03061900	Other, including flours, meals and	Free		
	pellets of crustaceans, fit for human			

Source: Archives, Indian Ministry of Commerce and Industry

Data II: Matched Firm-Manager Data

Company	Name	Executive Member	Sex	Father's Name
COSCO (INDIA) LTD	A JAIN	1	М	D K JAIN
COSCO (INDIA) LTD	M JAIN	1	М	D K JAIN
COSCO (INDIA) LTD	P JAIN	1	М	D K JAIN
COSCO (INDIA) LTD	V K SOOD	0	М	H R SOOD
COSCO (INDIA) LTD	D K JAIN	1	М	K L JAIN
COSCO (INDIA) LTD	N K JAIN	1	М	K L JAIN
COSCO (INDIA) LTD	N JAIN	1	М	N K JAIN
COSCO (INDIA) LTD	M P GUPTA	0	М	P D GUPTA
COSCO (INDIA) LTD	S SHARMA	0	М	R K SHARMA
COSCO (INDIA) LTD	R JAIN	0	F	S RAJ
COSCO (INDIA) LTD	M L MANGLA	0	М	T CHAND

Note: First and middle names abbreviated for clarity.

Data III: Novel Product Concordances

Prowess Products ITC HS Products Indu		Industry			
3008040800 3008040804	Sunflower seed oil Sunflower seed oil, refined	15121910	Sunflower oil edible grade	15142	Manufacture of vegetable oils and fats, excluding corn oil.
4012080400	Suitcases	420212.04	Plastic moulded suit-cases	19121	Manufacture of travel goods like suitcases, bags and holdalls etc.
5024200404	Distempers	321000.01	Distempers	24222	Manufacture of paints, varnishes, enamels or lacquers.
		84501100	Fully - automatic washing machines (up to 10kg)	_	Manufacture of other electric domestic
6308361216	Washing Machines/Laundry Mach	84501200	Other washing machines with built-in centrifugal drier (upto 10kg)	29308	appliances n.e.c.: dishwashers, household type laundry equipment,
		84501300	Other washing machines (upto 10kg)		parts and accessories for electrical domestic appliances

 > 2700 HS products mapped to > 6000 Prowess products and 400 industries < Back

Summary Statistics

	Obs	Mean	p10	p50	p90
Treated Firms (%)	83,715	0.50	0	0	1
Company Age	83,715	26.99	7	21	56
Wages	82,734	209.50	0	21	310
Gross Fixed Assets	82,056	2307.04	20	213	2618
Revenues	82,734	3431.10	1	365	4473
Expenses on Raw Materials	82,734	1400.09	0	137	1822
Family Firms (%)	82,114	0.44	0	0	1
Share of Baord that is Family	82,749	0.18	0	0	1



Alternative Profit Measure



Impact on Wage Bill, Assets, Raw Materials



Back

Firms that Professionalize Report Higher Productivity (Triple Difference)



Back