

Entry along the supply chain: removing growth restrictions on firms in India

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Motivation

- Policies to protect and promote small firms are common
 - ▶ US: Small Business Jobs Act - procurement contracts, grants, loans
 - ▶ Europe: Small Business Act - tax incentives, loans, guarantees
- Unintended negative consequences
 - ▶ barriers to growth for markets they aim to protect
 - ▶ constrain linked downstream (customer) markets

This paper: spill-over effects of barriers to growth

- How do removal of growth restrictions in intermediate input markets spill-over to entry and growth of firms in downstream markets?
- Inefficient intermediate input market
 - ▶ Firms incentivised to remain small produce low quality goods
 - ▶ This hampers access to high quality raw materials for downstream firms



Preview

- **Setting: Repeal of product reservation policy**
 - ▶ Hundreds of products stop being reserved for exclusive production by small firms
- **Economic mechanism:**
 - ▶ Segmentation based on product quality
 - ▶ Post reform increase in production of high quality goods
- **Main results:**
 - ▶ Downstream entry increases following deregulation
 - ▶ No observable decline in characteristics of new entrants
 - ▶ Ex-ante less productive downstream firms shrink (capex, employment)

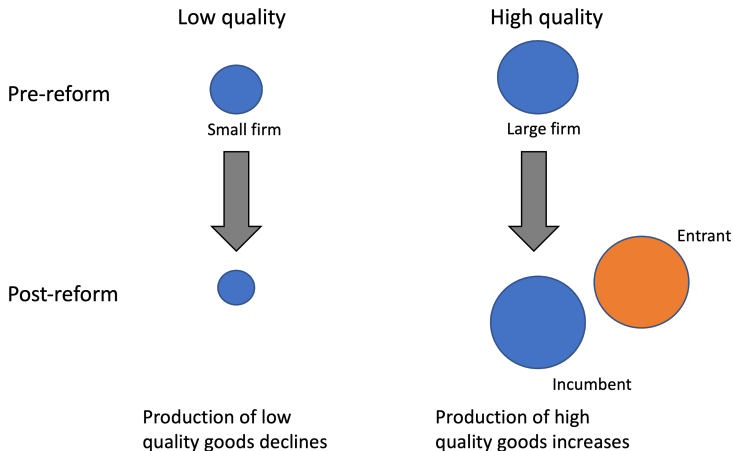
Setting: Dismantling of product reservation in India

- Product reservation: hundreds of products historically only allowed to be produced by small firms
- Large firms producing reserved products prior to reservation were allowed to continue operating but production was capped at existing levels
- 'Small' firm defined based on investment in fixed assets (plant and machinery)
Definition
- Products spanned many sectors including food, chemicals, electronics, and textiles. 1000+ products on the reserved list
- In 2000, firms producing reserved products accounted for 20% of employment
- Starting 1997, products began to be removed from the reserved list - staggered across time, and industries

Data

- Fourth round of the All India Census of Micro, Small and Medium Enterprises (MSME census)
 - ▶ Provides information on start year, location, employment, initial value of plant and machinery, inputs used, products produced for the reference year
 - ▶ Covers universe of small and medium establishments registered up to 31 March 2007
- Establishment level data from Annual Survey of Industries (ASI)
 - ▶ Provide information on balance sheet variables, employment, inputs used, products produced
 - ▶ Cover all establishments with 10+ (20+) workers using (not using) power
 - ▶ Larger establishments surveyed every year while smaller establishments covered on a sampling basis
- Combined data used to construct input-output(I-O) table I-O table

Mechanism: segmentation + product de-reservation



Mechanism: segmentation based on product quality

- Segmentation of regulated market:
 - ▶ Hypothesis: small firms produce low quality and large firms produce high quality products
 - ▶ Product quality is not observable
 - ▶ Assumption: price is a good proxy for quality in long quality ladder industries (Khandelwal, 2010)
 - ▶ Long quality ladder: industries with high range of product quality
Measure of quality ladder
- Prediction:
 - ▶ Significant difference in price of products produced by large and small firms in regulated markets in long quality ladder industries Regression

Overview of mechanism

- 1 Segmentation based on product quality
- 2 Cap on production of reserved products by large firms prior to reform → cap on supply of high quality goods
- 3 Post reform:
 - ▶ Small incumbents shrink (Martin et al., 2017) → production of low quality goods declines
 - ▶ Large incumbents and entrants produce high quality goods
 - ▶ Large incumbents and new entrants grow (Martin et al., 2017) → production of high quality goods increases
- 4 Implications for downstream markets:
 - ▶ Improved access to high-quality inputs for downstream firms
 - ▶ Effect on downstream entry and downstream incumbents

Hypothesis: downstream entry

- Prediction:

- ▶ With more efficient input markets → increase in downstream entry
- ▶ Downstream markets that use long quality ladder (high range of quality) inputs benefit more

Empirical specification: difference-in-differences

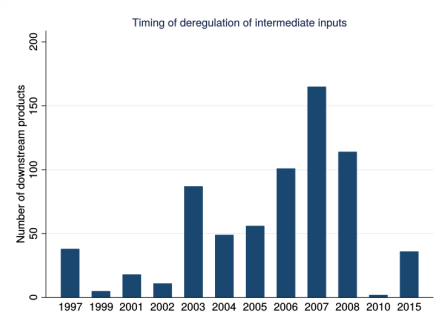
$$y_{p,d,t} = \beta_1 \text{DownDereg}_{p,t} + \delta_d + \delta_t + \delta_p + \varepsilon_{p,d,t}$$

- $y_{p,d,t}$: log of number of new firms for product p in district d started in year t
- DownDereg: switches from 0 to 1 when an input used in production of product p is de-reserved
- δ_d : District FE
- δ_t : Year FE
- δ_p : Product FE
- Control group: products unrelated to the regulation (products directly affected by the regulation and upstream products excluded)

Threats to identification

- Most major reforms completed before de-reservation
 - ▶ Tariffs largely harmonised across industries by the late 1990s
 - ▶ By 1998, 93% of industries were no longer subject to licensing requirements
- Identifying assumption: timing of de-regulation is unrelated to investment opportunities in downstream market

- ▶ Path of a product to de-regulation circuitous
- ▶ Timing unlikely to be systematically related to downstream industry conditions
- ▶ Variation in timing of de-regulation

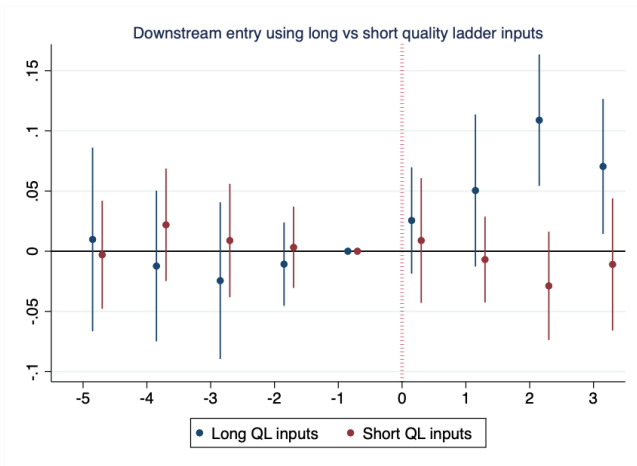


Downstream entry

	(1)	(2)
	log(#entrants)	log(#entrants)
DownDereg	0.016 (0.711)	
DownDereg × Short QL inputs		-0.017 (-0.951)
DownDereg × Long QL inputs		0.062** (1.983)
District FE	Yes	Yes
Product FE	Yes	Yes
Year FE	Yes	Yes
Observations	115282	113605
R^2	0.217	0.217

- No effect for downstream markets that use short quality ladder inputs
- 6.2% increase in entry in downstream markets that use long quality ladder inputs
- Back of the envelope calculation: 77k additional firms created in 3 years

Downstream entry by heterogeneity of quality of inputs



Reform led to 2.6%, 5.0%, 10.9% and 7.0% increase in entry in downstream markets that use long quality ladder inputs

Hypothesis: quality of new entrants

- Hypothesis:
 - ▶ Low quality entrepreneurs start firms → new firms smaller and grow less
 - ▶ Entrepreneurs drawn from homogenous quality distribution → no difference in quality of new entrants
- Measures of quality
 - ▶ ex-ante: size (plant and machinery) at startup
 - ▶ ex-post: output

Ex-ante measure of quality of entrants

	(1)
	log(startup assets)
DownDereg	-0.005 (-0.156)
District FE	Yes
State \times Product FE	Yes
Start year FE	Yes
Observations	693520
R^2	0.654

No statistically significant difference in the size at entry

Ex-post measure of quality of entrants

	Full sample (1) log(output)	Within 1yr of entry (2) log(output)
DownDereg	-0.019 (-0.900)	0.016 (0.321)
District × Firm age FE	Yes	Yes
State × Product × Firm age FE	Yes	Yes
Year of entry × Firm age FE	Yes	Yes
Observations	906839	92024
R^2	0.610	0.582

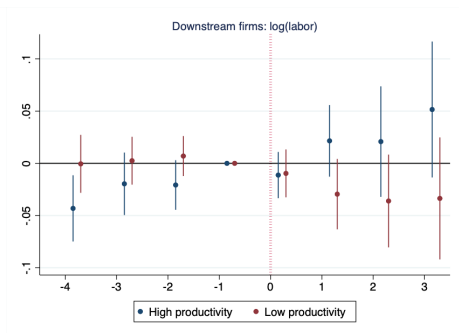
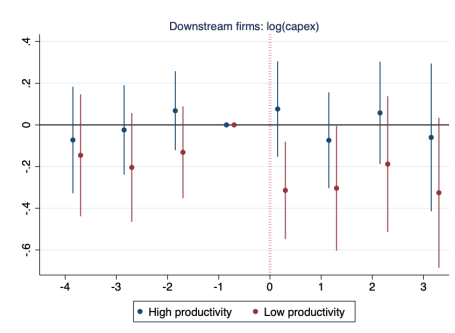
No statistically significant difference in ex-post output

Empirical specification: downstream incumbents

$$y_{i,t} = \beta_1 \text{DownDereg}_{i,t} + \delta_i + \delta_t + \varepsilon_{i,t}$$

- Downstream incumbents: customers of de-regulated market
- $y_{p,d,t}$: log of sales, employment, capex, profits, or debt for firm i in year t
- DownDereg: switches from 0 to 1 when input used in production of product p is de-reserved
- δ_i : Firm FE
- δ_t : Year FE
- *Productivitydummy* _{i} : takes value 1 for above median ex-ante productivity
- Control group: firms producing products unrelated to the regulation (products directly affected by the regulation and upstream products excluded)

Downstream incumbents



Productive downstream firms grow and less productive ones shrink

Robustness

- Hold up story
 - ▶ Larger firms (higher bargaining power) increase investment
- Uncertainty/risk of sourcing inputs from small firms
 - ▶ Older, more established firms pose lower risks as suppliers
 - ▶ Results similar for downstream markets that source inputs from below and above median proportion of older firms in upstream markets
- Product switching
 - ▶ Exclude products that firms switch out of from control group

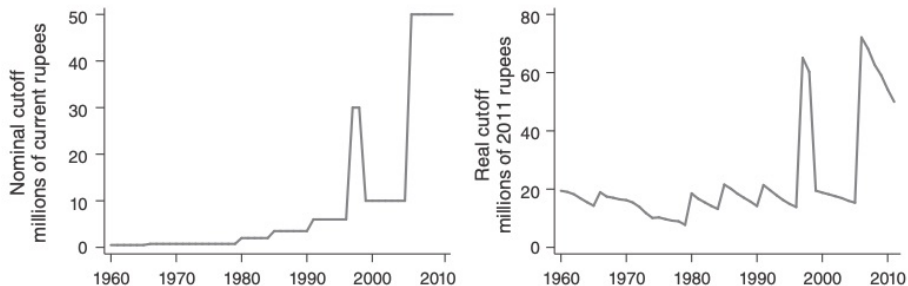
Conclusion

- Improved access to high quality raw materials:
 - ▶ Downstream entry increases in markets using long quality ladder inputs
 - ▶ No observable decline in quality of new entrants
 - ▶ Productive downstream firms grow while less productive ones shrink
- Implications:
 - ▶ Business dynamism has positive spill-over effects along the supply chain
 - ▶ Removal of barriers to growth led to increased entry and reallocation

Thank you!

Criteria to be considered 'small'

Panel A. Maximal size cutoffs over time



Source: Rotemberg, AER 2019

- 'Small' firm defined based on investment in fixed assets (plant and machinery)
- Eligibility at the establishment level
- Limit changed roughly every 6 years
- changes until late 1990s - to keep pace with inflation
- Period of study: 2000-2010 where limit changed from INR 10mn (USD 140k) to INR 50mn (USD 700k) in 2006; eligibility cutoff also changed for reserved products

Measure of length of quality ladder

- Khandelwal (2010) uses imports to the US to infer quality
- Intuition: conditional on price, imports with higher market share are assigned a higher quality
- Significant heterogeneity in product market scope for quality differentiation
- Quality ladder: range of qualities within a product market (HS code)
- Aggregate measure to 4 digit ISIC (NIC 98) to classify industries into long (above median dispersion) and short (below median dispersion) quality ladder industries [Back](#)

Segmentation of the market

Prices relative to small firms			
	(1)	(2)	(3)
	log(Price)	log(Price)	log(Price)
Medium	0.147** (2.251)	0.139*** (2.713)	0.144*** (8.836)
Large	0.357** (2.181)	0.161* (1.932)	0.197*** (7.923)
Product FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Sample	Regulated	Regulated	Not regulated
Years	Pre	Pre	All
"Clean" prices	No	Yes	Yes
Observations	7135	5681	109327
R^2	0.855	0.897	0.797

Large firms produce higher quality goods (charge higher prices) relative to small firms in regulated markets [Back](#)

Identifying products along the supply chain

- Establishments report all main inputs used and products produced (product code, quantity and total value)
- Input-output(I-O) table constructed using single-product firms
 - ▶ Percentage by value of an input \times percentage of total production of product by this establishment in the economy - summed across each input-product pair
 - ▶ Only inputs above a 1% threshold considered for identifying the supply chain
- Downstream products: at least one input used in their production (as per I-O table) is deregulated
 - ▶ Match list of deregulated products to inputs used from I-O table
 - ▶ Products produced using these inputs
- Upstream products: all inputs used in the production (as per I-O table) of deregulated products
 - ▶ Match list of deregulated products to products produced from I-O table
 - ▶ Inputs used in the production of these products