

Uncovering Productivity Puzzles in Thailand:

Lessons from Microdata

Archawa Paweenawat

Thitima Chucherd

Nakarin Amarase

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Presentation Outline





Relative to the U.S.A., productivity of most Asian countries have dropped over the past four decades

Part I: Thailand's Productivity



Average Total Factor Productivity (USA = 1.0)

Source: Feenstra, Robert C., Robert Inklaar and Marcel P. Timmer (2015), "The Next Generation of the Penn World Table" American Economic Review, 105(10), 3150-3182, available for download at www.ggdc.net/pwt



Productivity slowdown after the crisis

Part I: Thailand's Productivity



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TFP stylized facts



Source: NSO, NESDB, Industrial Census, Business, Trade and Services Survey as well as Business Trade and Services Census and calculated by authors



Labor reallocation in the past

Labor productivity is the future

Part I: Thailand's Productivity



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Part I: Thailand's Productivity

Labor Productivity Relative to Frontier (90th Percentile=1)



Source: NSO, NESDB, Industrial Census, Business, Trade and Services Survey as well as Business Trade and Services Census and calculated by authors

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Presentation Outline





Productivity could be different, but profitability should be equal

Part II: Resource Misallocation

Monopolistic Competition

Better will be bigger

Productivity (TFPQ)

$$TFPQ_{si} \equiv A_{si} = \frac{Y_{si}}{K_{si}^{\alpha_s} L_{si}^{1-\alpha_s}}$$

High TFPQ



Low TFPQ



Profitability (TFPR) $TFPR_{si} \equiv P_{si}A_{si} = \frac{P_{si}Y_{si}}{K_{si}^{\alpha_s}L_{si}^{1-\alpha_s}} \propto \frac{(1+\tau_{Ksi})^{\alpha_s}}{1-\tau_{Ysi}}$

High TFPR







TFPR Dispersion More efficient



Allocative efficiency dropped in 2011

Part II: Resource Misallocation

- Allocative efficiency drops in 2011
- Low efficiencies in comparison to the U.S.
- Large TFP gains from increasing the efficiencies to the U.S. level (75–130%)





Sources: MIC 1997, 2007, 2012, NSO; Calculated by the authors



Small plants are too big and big plants are too small

Part II: Resource Misallocation









Correlated distortions worsen the misallocation problem

Part II: Resource Misallocation

Correlated distortions in Thailand





Discontinuities around the cutoff plant sizes

Part II: Resource Misallocation

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Size	Employment	Capital
Small	1–50	0-50 mil.
Medium	51-200	50-200 mil.
Large	201+	> 200 mil.



Ministerial Regulation under the Small and Medium Enterprises Development Act, B.E. 2543





Source: MIC 2007, NSO; Calculated by the authors



Part II: Resource Misallocation

- Without any distortion, all plants would have the same level of TFPR
- Among small plants, TFPRs increase with plant size
- On the other hand, for medium and large plants, TFPRs are quite uncorrelated with plant size





2.0

1.6

1.2

0.8

0.4

0.0

0

100

Productivity

Small and medium plants don't invest much

Part II: Resource Misallocation

- Correlated distortions lower the plant's incentive to increase its size and productivity
- Correlated distortions can lower the aggregate TFP by 25 percent in India and Mexico in relative to the U.S.
- We find similar evidence among Thai plants

Productivity

◆ 50th Percentile

▲ 75th Percentile

400



Employment Source: MIC 2007 & MIC 2012, NSO; Calculated by the authors; Hsieh and Klenow (2014)

200

300



 Plants with R&D activity are more productive than plants without R&D activity



Productivity Distribution

- Part II: Resource Misallocation
 Using a matching technique, we compare
- "Apples to Apples"

Plant's Characteristics in the Matched Sample (2006)

Variables	Plants with R&D	Plants without R&D
log(Age)	2.486	2.484
log(Size)	4.101	4.101
Capital intensity	12.844	12.838
Export	0.317	0.317
Import	0.295	0.295
FDI	0.083	0.083

Plants with R&D activity are 35–57% more productive.

$$ATT = \mathbf{E} \left(TFPQ_i^{R\&D} - TFPQ_i^{No \ R\&D} | R\&D_i = 1 \right)$$

ATT	2006	2011
TFPQ	0.2976***	0.4515***
	(0.0750)	(0.1235)

Presentation Outline





Part III: Industry-level Perspectives

TFP

TFP widely dispersed across industries and mostly slowed down



Part III: Industry-level Perspectives



Resource misallocation

Allocative efficiency also widely dispersed Highly productive industry not necessarily allocated resources well



ALLOCATIVE EFFICIENCY (2011)

Source: NSO, authors' calculation



Determinants of allocative efficiency

Regression analysis



Source: NSO, BOT, Department of Business and Development, authors' calculation

Part III: Industry-level Perspectives



Determinants of allocative efficiency

Highly concentrated industries tend to have higher allocative efficiency







Determinants of allocative efficiency

R&D also lifted up potential TFP, whereas contemporaneous TFP has not realized yet





Part III: Industry-level Perspectives

High productivity, frontier firms invest more R&D

R&D Activities in Manufacturing Sector in 2011





Part III: Industry-level Perspectives

High productivity, frontier firms invest more R&D

R&D Activities in Manufacturing Sector in 2011





One third of aggregate TFP growth in manufacturing sector contributed from market share reallocation between survival, entry, and exit firms



Decompose TFP growth into contributions from survival, entry, and exit firms





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TFP GROWTH DECOMPOSITION OVER 2006-2011, Manufacturing Sector





Source: Melitz and Polanec (2015)'s decomposition approach, NSO, authors' calculation

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TFP GROWTH DECOMPOSITION OVER 2006-2011,

Decompose TFP growth into contributions from survival, entry, and exit firms

Source: Melitz and Polanec (2015)'s decomposition approach, NSO, authors' calculation

Market share reallocation widely different across industries

Source: NSO, authors' calculation

Policy Implication

1. Enhance manufacturing productivity
 Improve within-firm productivity
 (lower frontier-laggard gap)
 Promote resource reallocation
 (review correlated distortion and size-dependent policies)

2. Reinforce the mechanism of creative destruction

Promote competition policy and market reform Improve financial and technology access especially for SMEs

Thank you