

# TRADE LIBERALIZATION AND PRODUCTIVITY: EVIDENCE FROM FIRM-LEVEL STUDIES

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# Introduction

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- Differences in per-capita income across countries mostly result from differences in total factor productivity (TFP).
  - “Large differences in output per worker between rich and poor countries have been attributed, in no small part, the differences in total factor productivity” (Hsieh and Klenow, 2009, QJE, p.1403)
  - “cross-country income differences mostly result from differences in total factor productivity” (Waugh, 2010, AER, p.2095).
- Clarifying underlying causes of lower productivity in developing countries thus is one of the central concerns in various fields of economics.
  - e.g., development economics, international economics, and macroeconomics.

# Introduction

## Two notable facts:

- 1 Regional integration has been rising in Asia.
  - In terms of trade, financial portfolio, foreign direct investment (FDI), and banking credit, the cross border flows within the region are increasing although with different speed.
- 2 Among several recent development trend that concern policy makers in Asia, the deceleration of productivity growth is one of them.
  - Especially since the global financial crisis in 2008.
  - Whether we measure it by TFP or labor productivity.

# Introduction

## Questions:

- ① What are channels of transmission that regional integration affects productivity, and what causes the deceleration of productivity?
- ② What is the policy direction the officials in the region must focus on reverse the trend?

# Mechanism

# Aggregate and Firm-level Productivity Growth

Aggregate productivity growth can be decomposed into 3 effects:

[Aggregate Productivity Growth]

= [Within effect] + [Reallocation effect] + [Entry/exit effect]

- ① **Within effect:** the productivity growth of individual firm (within each firm)
- ② **Reallocation effect:** The changes in market share between firms
  - Productive firms expand while less productive firms shrink.
- ③ **Entry/exit effect:**
  - Productive firms enter into market while less productive firms exit from the market.

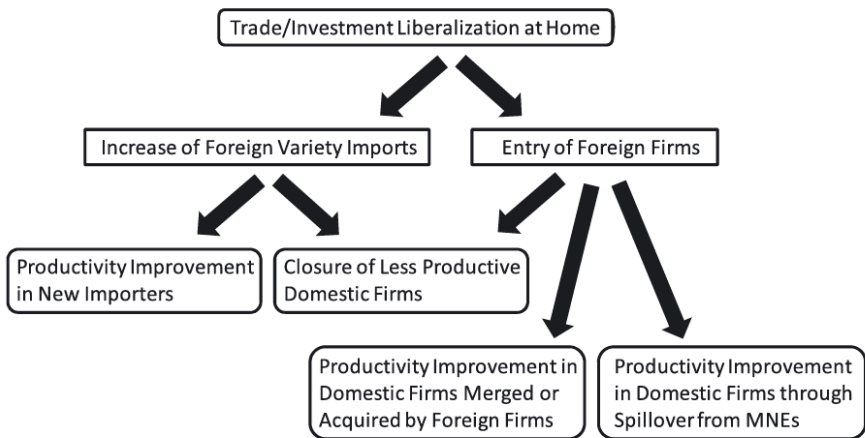
# Aggregate and Firm-level Productivity Growth

$$\begin{aligned}
 \text{Aggregate Productivity Growth} &\simeq \underbrace{\sum_{i \in S} v_{i,t-1} \Delta \ln \varphi_{it}}_{\text{Within effect}} \\
 &+ \underbrace{\sum_{i \in S} \Delta v_{it} (\ln \varphi_{i,t-1} - \overline{\ln \varphi_{t-1}})}_{\text{Reallocation effect}} + \sum_{i \in S} \Delta v_{it} \Delta \ln \varphi_{it} \\
 &+ \underbrace{\sum_{i \in N} v_{it} (\ln \varphi_{it} - \overline{\ln \varphi_{t-1}})}_{\text{Entry effect}} + \underbrace{\sum_{i \in X} v_{i,t-1} (\overline{\ln \varphi_{t-1}} - \ln \varphi_{i,t-1})}_{\text{Exit effect}},
 \end{aligned}$$

where  $\varphi_{it}$  is the TFP of firm  $i$  in year  $t$ :  $S$ ,  $N$ , and  $X$  are the set of survivors, entrants, and exiters between year  $t - 1$  and year  $t$ ;  $\Delta$  is the difference between year  $t - 1$  and year  $t$ ; TFP with an upper bar denotes the average TFP level (Foster, Haltiwanger, and Krizan, 2001, NBER).



# Trade Liberalization and Productivity Growth



Source: Hayakawa, Machikita, and Kimura (2012, JES, Figure 2)

# Evidence:

# The Case of Vietnam

# Evidence: The Case of Vietnam

- We focus on Vietnamese manufacturing firms between 2000 and 2009, including the year 2007 when Vietnam joined the World Trade Organization (WTO).
- We utilize firm-level data in Vietnamese manufacturing to conduct the following two analyses:
  - 1 Following Foster, Haltiwanger, and Krizan, 2001, (NBER), we decompose aggregate productivity growth:
 

[Aggregate Productivity Growth]  
= [Within effect] + [Reallocation effect] + [Entry/exit effect]
  - 2 Following Hsieh and Klenow (2009, QJE), we estimate the distortions in output and capital market (which affect the productivity of firms):

$$\underbrace{\pi}_{\text{profit}} = \underbrace{\kappa_Y PY}_{\text{sales}} - \underbrace{wL}_{\text{labor cost}} - \underbrace{\kappa_K RK}_{\text{capital cost}} \quad (1)$$

[Aggregate Productivity Growth]

= [Within effect] + [Reallocation effect] + [Entry/exit effect]

**Table 1. Decomposition of the annual TFP growth in the manufacturing**

Period	TFP growth total	Within effect	Reallocation effect	Entry/exit effect
2000-01	0.050	-0.021	0.081	-0.009
2001-02	0.011	-0.080	0.081	0.009
2002-03	0.156	0.061	0.098	-0.003
2003-04	0.071	-0.024	0.105	-0.010
2004-05	-0.052	-0.135	-0.165	0.248
2005-06	-0.110	-0.085	0.260	-0.285
2006-07	0.110	0.049	0.054	0.007
2007-08	0.080	-0.029	0.103	0.006
2008-09	-0.005	-0.093	0.249	-0.162
Average	0.035	-0.040	0.096	-0.022

Source: Ha and Kiyota (2014, JER, Table 7)

- Trade liberalization through the entry of the WTO might facilitate the reallocation among firms.

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- Although the contribution of the reallocation effect to the aggregate productivity growth increased after 2007, this effect was not large enough to offset the negative entry/exit effects for 2008–09.
- As a result, the aggregate TFP growth turned into negative between 2008 and 2009.

**Table 2. Distortions in Output and Capital Markets, by Year**

Year	Distortions in output market		Distortions in capital market	
	Mean	S.D.	Mean	S.D.
2000	1.97	1.71	2.55	4.92
2001	2.01	2.02	2.74	7.86
2002	2.15	2.27	2.90	5.13
2003	2.14	1.75	3.19	5.79
2004	2.26	2.59	3.60	6.78
2005	2.25	2.34	3.88	9.16
2006	2.18	2.47	4.09	8.55
2007	2.02	1.74	4.21	8.45
2008	1.75	1.53	3.82	13.16
2009	1.74	1.90	3.58	20.54
Average	2.01	2.04	3.62	11.47

Source: Ha and Kiyota (2014b, manuscript, Table 6)

- Distortions in output market declined significantly from 2007.
  - Standard deviation (S.D.) significantly increased from 2008.
- This implies that more firms tended to face higher distortions in capital market from 2008.

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Source: Ha and Kiyota (2014b, manuscript, Table 6)

- Trade liberalization contributed to remove the distortions in output market.
- However, the increases in the distortions in capital market, possibly attributable to the global financial crisis from 2008, offset the positive effect of trade liberalization.

# Concluding Remarks



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- ① What are channels of transmission that regional integration affects productivity, and what causes the deceleration of productivity?
- Aggregate productivity growth can be decomposed into three effects:
  - ① Within effect: the productivity growth of individual firm
  - ② Reallocation effect: changes in the resource reallocation between firms
  - ③ Entry/exit effect (e.g., the exit of less productive firms).
- In the case of Vietnam, Ha and Kiyota (2014a, JER) confirmed that trade liberalization affected the productivity growth through reallocation effect channel.

# Concluding Remarks

- ② What is the policy direction the officials in the region must focus on reverse the trend?
- An important effect of trade liberalization may be the removal of distortions in domestic market.
- In the case of Vietnam, Ha and Kiyota (2014b) found:
  - The distortions in output market showed significant decline from 2007.
  - On the contrary, the distortions in capital market increased after 2007.
- Some of the positive effects of trade liberalization may be offset by the negative effects of financial crisis.

# Concluding Remarks

- These results imply that trade liberalization is not a panacea.
- Further reforms in capital market could improve aggregate TFP in Vietnam. For example, ...
  - decrease financial frictions (Midrigan and Xu, 2014, AER).
  - change negative entry/exit effect to be positive  
... Zombie lending (like a banking crisis in 1997 in Japan)?  
(Nishimura, Nakajima, and Kiyota, JEBO; Caballero, Hoshi, and Kashyap, 2008, AER).
- Further studies are needed to identify the sources of distortions in capital market.
- These implications can be applied to some of the other ASEAN countries.

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