企業ダイナミクスと集計レベルの生産性

一橋大学
HITOTSUBASHI UNIVERSITY

財務省財務総合政策研究所
2023年2月21日

生産性・所得・付加価値に関する研究会

一橋大学　宮川大介

1．研究会のテーマ

1. 集計レベルの生産性水準の差異？
   - 産業構造、物価水準・相対価格、為替レート
2. 集計レベルの生産性成長率の差異？
   - 労働投入、労働の質、付加価値、計測方法
3. 生産性変化のメカニズム（原因と帰結）？
   - 生産性計測と描写の方法
   - 生産性変動の要因
   - 分配、需要の創出

2．本日の報告内容

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2．本日の報告内容（続き）

a. 生産性ダイナミクス・分解のフレームワーク
b. コロナ禍前後の生産性ダイナミクス
   Miyakawa and Takizawa '22

c. 再分配効果①：Exit, entry, incumbent
   Ito and Miyakawa '23
d. 再分配効果②：Shadow of death
   Miyakawa, Ueda, and Oikawa '23
e. 内部効果：
   Arata and Miyakawa '23

f. まとめと課題

a. フレームワーク

- BHC-FHK decomposition

Productivity is benchmarked

$$\Delta\Phi_{t-1\to t} = \underbrace{\sum_{i\in Inc} s_{i,t-1}(\varphi_{i,t}-\varphi_{i,t-1})}_{\text{Within}} + \underbrace{\sum_{i\in Suv}(s_{i,t}-s_{i,t-1})\varphi_{i,t-1}}_{\text{Between/Share}} + \underbrace{\sum_{i\in Suv}(s_{i,t}-s_{i,t-1})(\varphi_{i,t}-\varphi_{i,t-1})}_{\text{Covariance/Cross}} + \underbrace{\sum_{i\in Ent} s_{i,t}\varphi_{i,t}}_{\text{Entry}} + \underbrace{\sum_{i\in Ext} s_{i,t-1}\varphi_{i,t-1}}_{\text{Exit}}$$

where

$\Delta\Phi_{t-1\to t}$: Change in the aggregate productivity

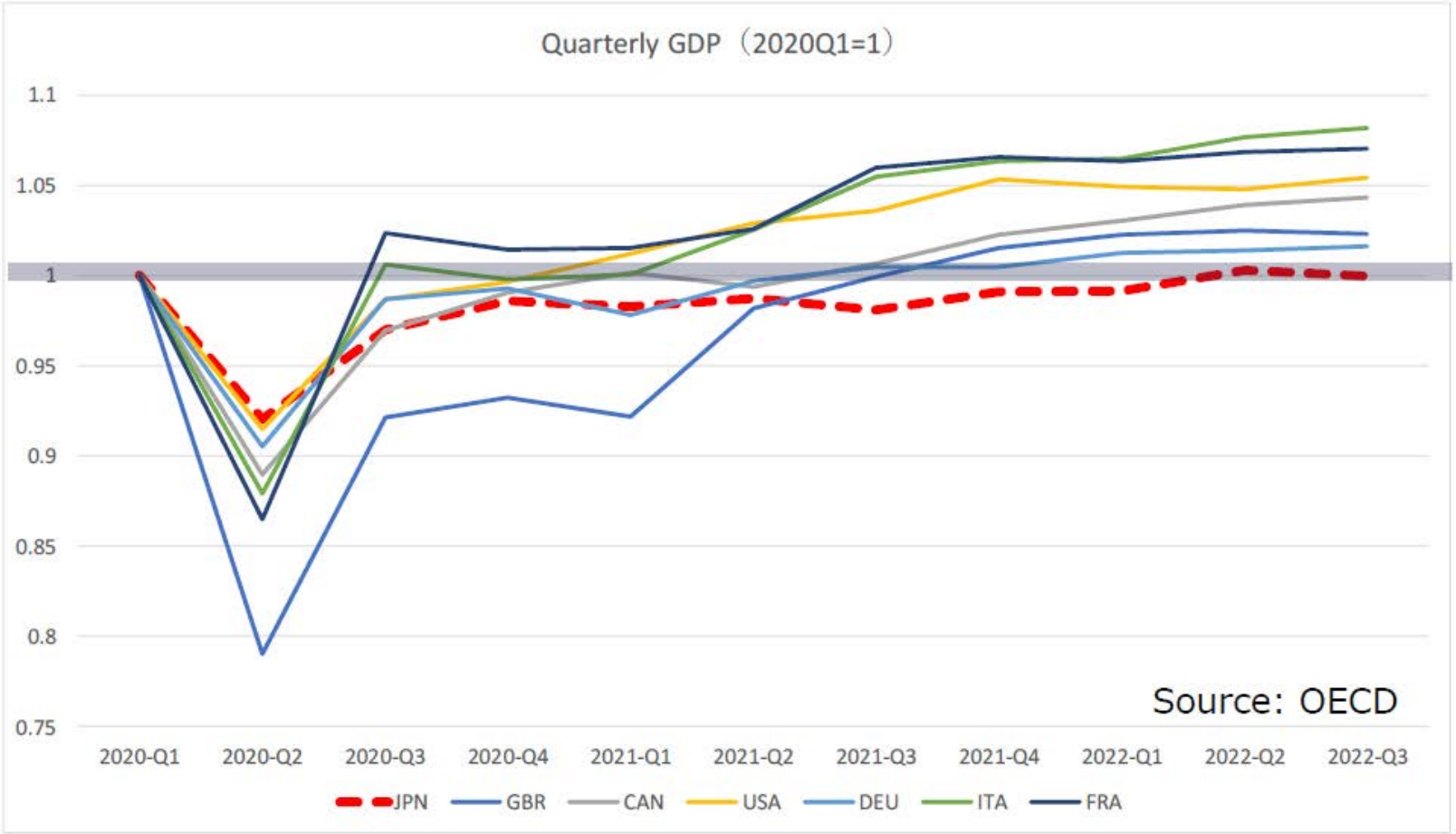
$s_{i,t}$: Share of firm i in t

$\varphi_{i,t}$: Productivity of firm i in t

Inc, Ent, Ext: Incumbent, entrants, exits in t

b. 実例

Destruction & recovery

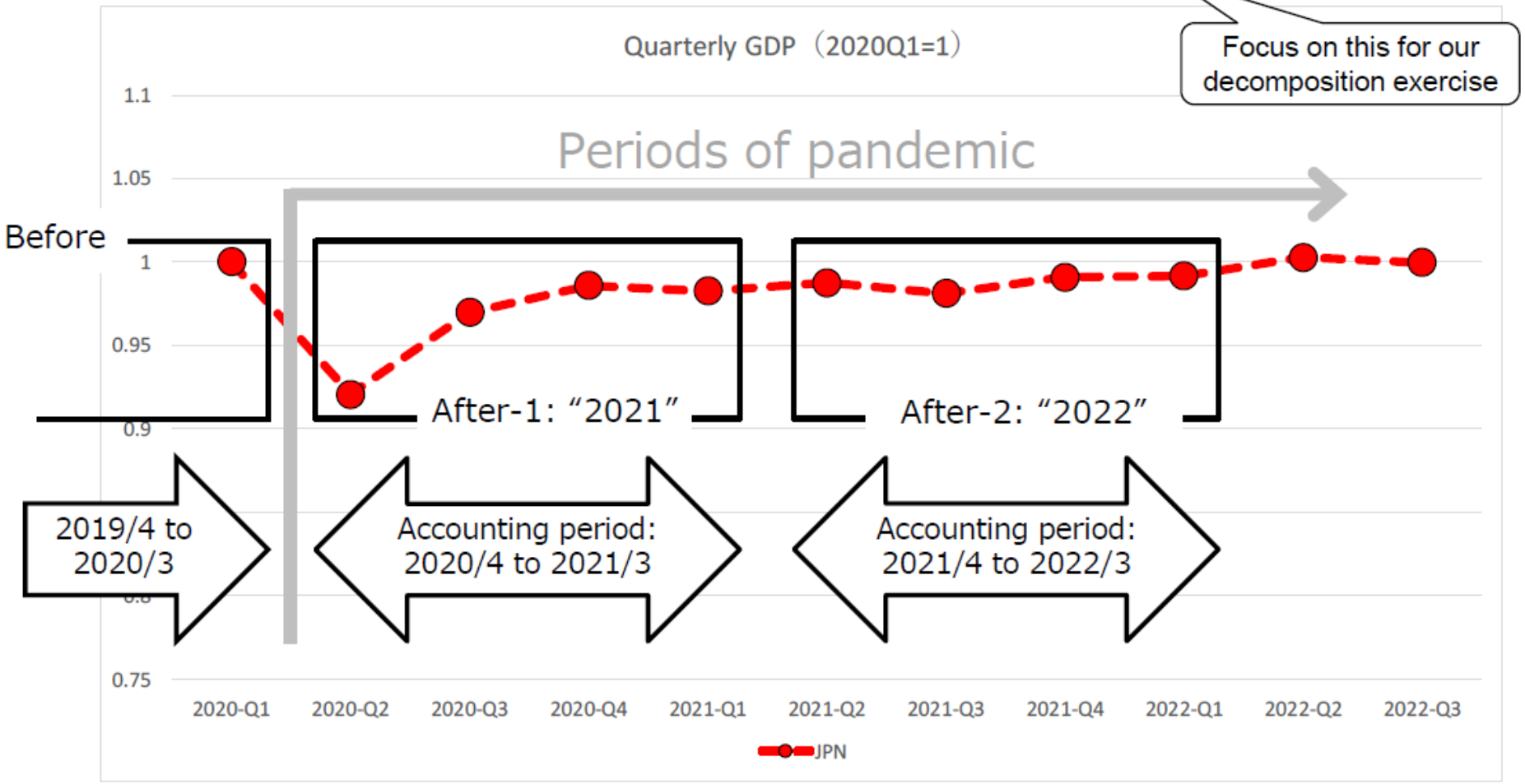


b. 実例

- Tokyo Shoko Research Ltd. (a.k.a.TSR) Data
  - TSR in Japan ≒ Dun & Bradstreet in the U.S.
  - 1m/year firm-level panel w/ basic info (e.g., sales)
    - 0.5m/year firm-level panel data with F/S
    - Exit info & entry info (coverage is an issue)
  - E.g. *Carvalho et al. QJE '20*

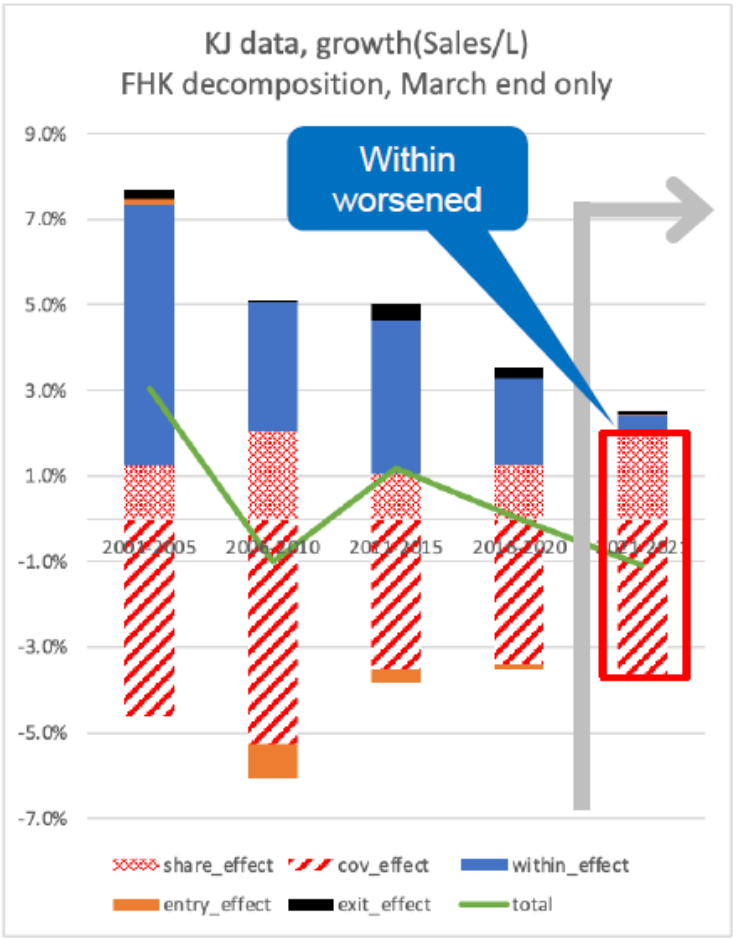
b. 実例

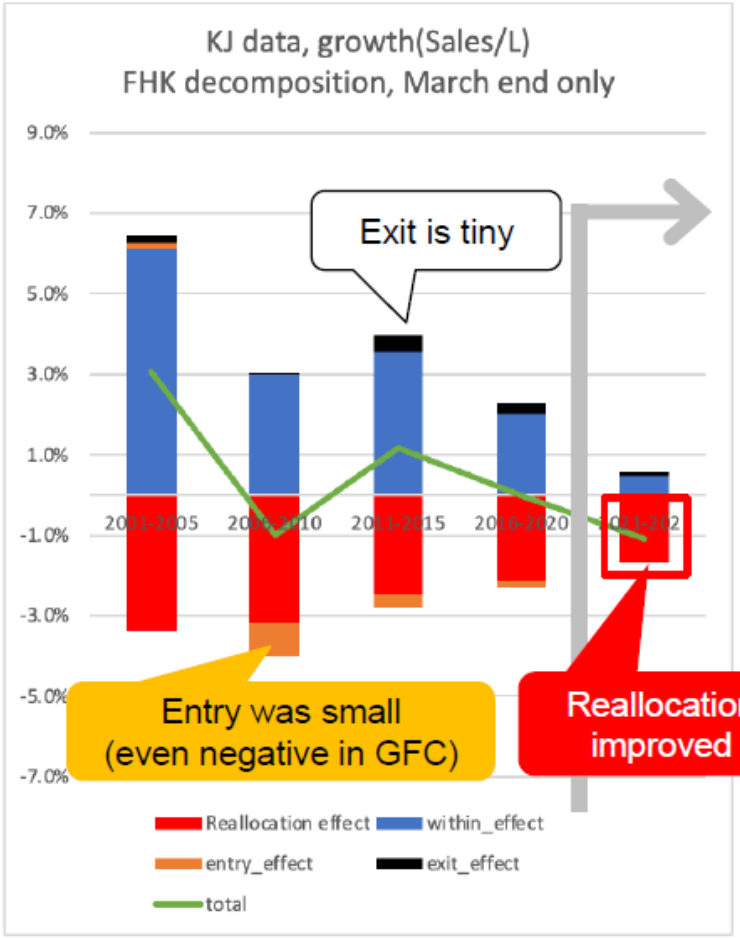
- Major accounting periods: April-to-March



b. 実例

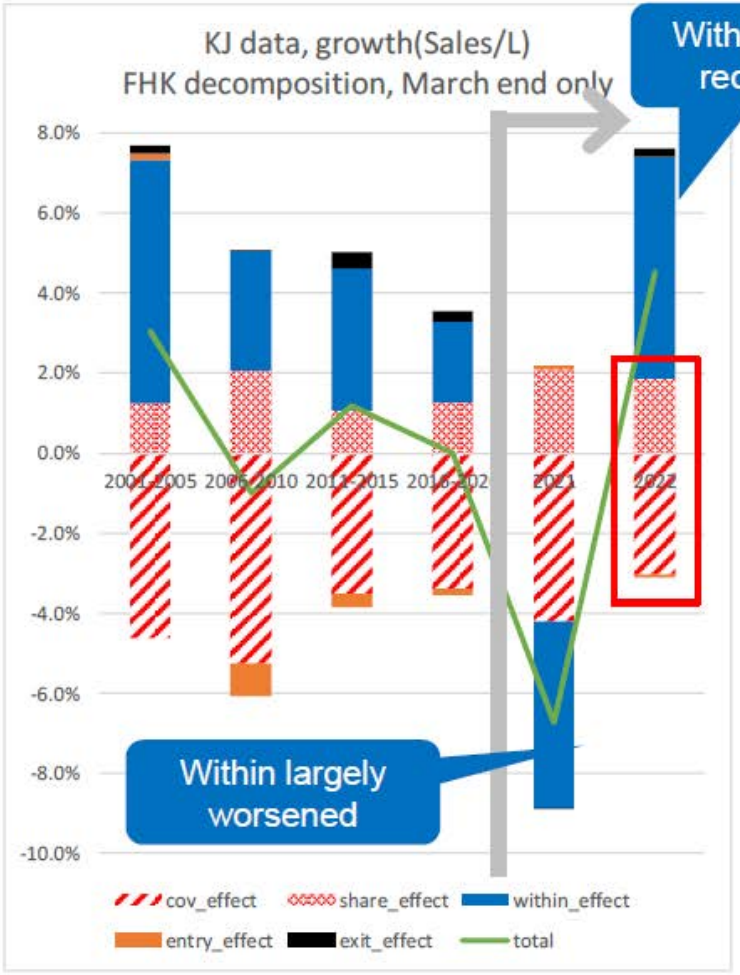
◘ Before vs. During





b. 実例

- Before vs. 2021 vs. 2022



c. 再配分効果①

- *Freeman et al. '21*: Exit ⇒(+)⇒ Entry

The contribution of business dynamics to productivity growth in the Netherlands

Daan Freeman* Leon Bettendorf† Gerrit Hugo van Heuvelen‡
Gerdien Meijerink§

July 2021

Abstract

This paper analyses the declining firm dynamism in the Netherlands, which may explain part of the slowdown in productivity growth. We use a rich microdata set including nearly all corporations in the Netherlands during 2006-2016, which enables us to evaluate the TFP growth contributions of exiting firms, start-ups and new firms resulting from mergers & acquisitions in different industries. We use a Melitz and Polanec (2015) decomposition to assess TFP growth contributions. We find that in service industries, start-ups, new firms created by M&As and exiting firms all contribute to overall TFP growth, in line with the creative destruction hypothesis. In manufacturing industries, TFP growth is driven mostly by incumbent firms. Here, entry and exit dynamics contribute relatively little or even negatively to TFP growth. In addition, young firms in the manufacturing industries tend to have higher TFP growth than older firms, while in service industries this is not the case. Finally, in general, relatively low productivity entrants are more likely to exit in the first five years after entry, which is in line with an 'up-or-out' dynamic.

Keywords: productivity slowdown, firm dynamics, TFP

*CPB Netherlands Bureau for Economic Policy Analysis. Corresponding author. E-mail: D.Freeman@cpb.nl. CPB, P.O. Box 80510, 2508 GM, The Hague, The Netherlands.
†CPB Netherlands Bureau for Economic Policy Analysis. E-mail: L.J.H.Bettendorf@cpb.nl.
‡CPB Netherlands Bureau for Economic Policy Analysis. E-mail: G.H.van.Heuvelen@cpb.nl.
§CPB Netherlands Bureau for Economic Policy Analysis. E-mail: G.W.Meijerink@cpb.nl.

Figure 4: Contribution of net entry (pure and M&A) to average annual productivity growth (in %-points), 2006-2015, per industry

The bubble size reflects the size of the industry measured by value added.

C. 再配分効果①′

- *Ito & Miyakawa '23*: Negative exit effect by merger

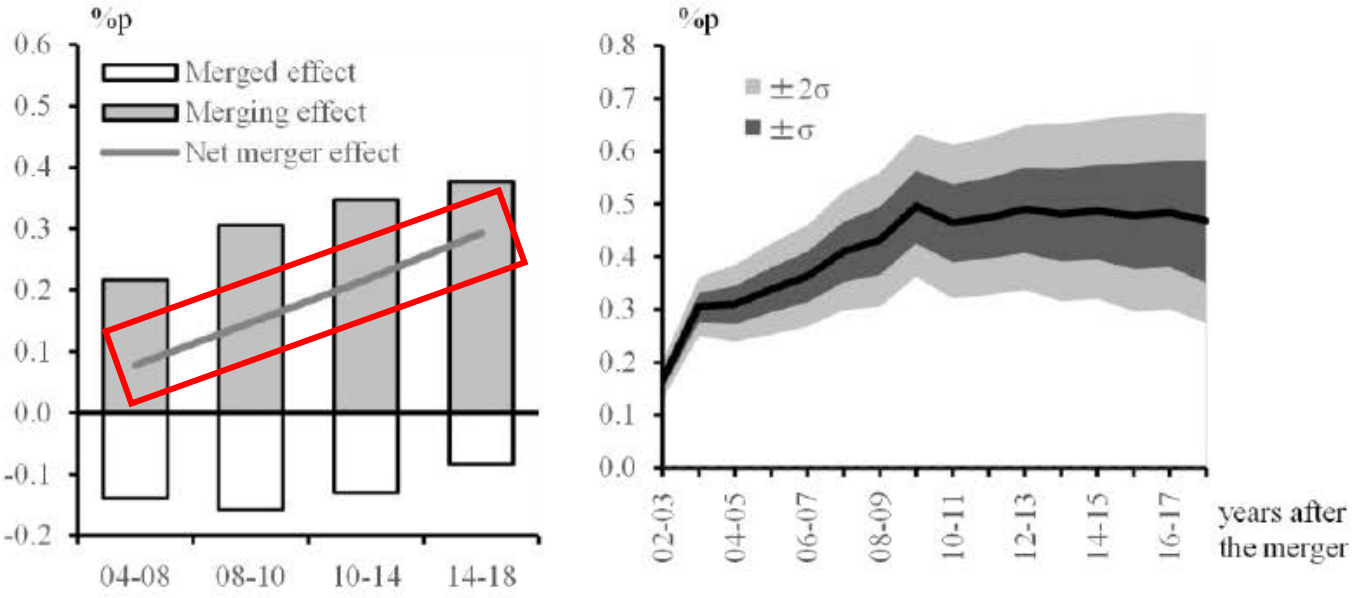
Table 4: Decomposition of entry effect and exit effect

periods	Entry			Exit				
		Establishment	Indin	i=	Bankruptcy	Closure	Merger	Indout
	f=g+h	g	h	j+k+l+m	j	k	l	m
2000-2010	0.03	-0.17	0.20	-0.46	-0.06	0.09	-0.33	-0.16
2010-2018	0.10	-0.11	0.21	-0.33	-0.00	0.13	-0.29	-0.17
2000-2004	0.13	-0.16	0.29	-0.51	-0.08	0.04	-0.25	-0.22
2004-2008	-0.01	-0.16	0.15	-0.41	-0.04	0.12	-0.37	-0.13
2008-2010	-0.12	-0.22	0.10	-0.46	-0.06	0.12	-0.41	-0.11
2010-2014	0.01	-0.16	0.17	-0.31	-0.01	0.14	-0.32	-0.13
2014-2018	0.19	-0.06	0.25	-0.35	-0.00	0.11	-0.26	-0.20

Note: The table gives the results of our decomposition exercise for the entry and exit effects.

C. 再配分効果①′

- *Ito & Miyakawa '23*: Exit ⇒(+)⇒ Incumbent



Note: (a) depicts the net merger effects for each period; (b) depicts those for each year. We calculate the net merger effect in (b) by adding the merger effect for targets to the mean value and the standard deviation (±σ and ±2σ) of the merger effect for acquirers.

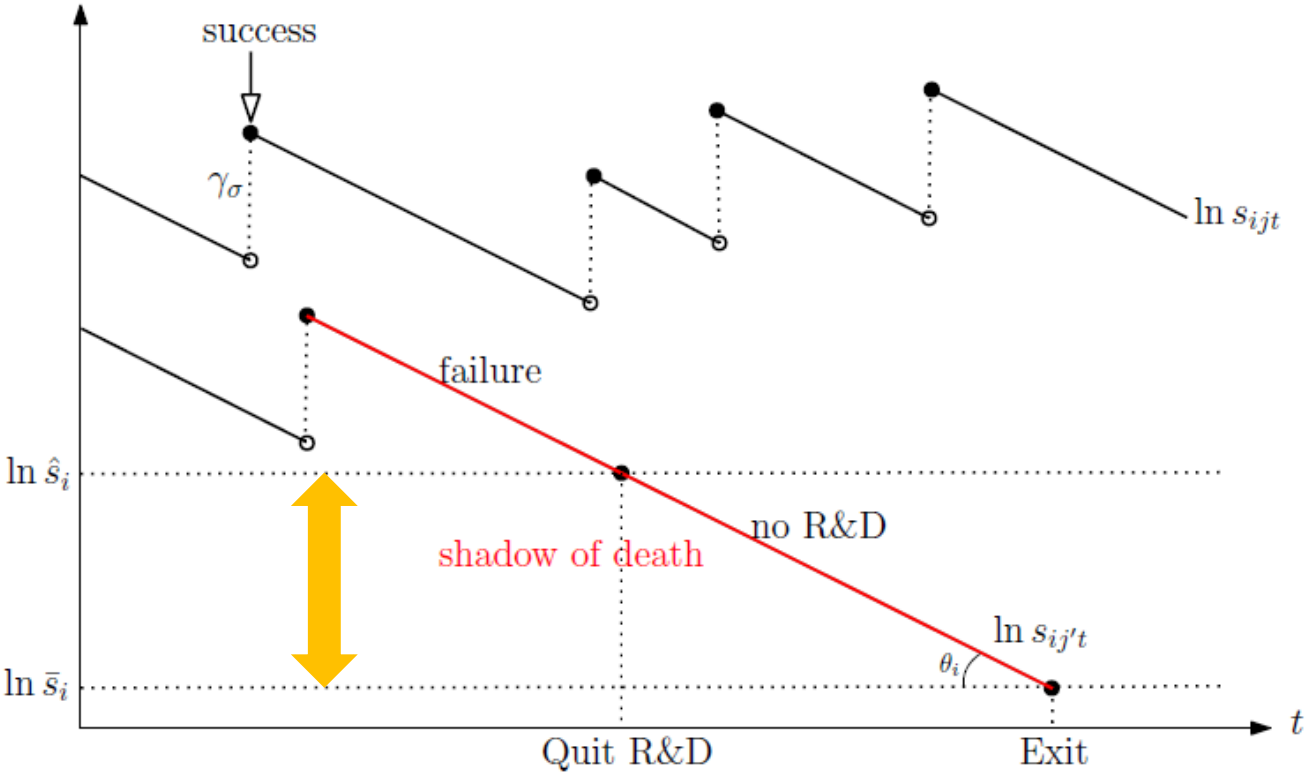
d. 再配分効果②

- Unique business dynamism in Japan

Facts	Japanese Data	US Data	Lower knowledge diffusion (e.g., Akcigit & Ates '21)
1. Entry	↓	↓	↓
2. Young firms' empl. share	↓	↓	↓
3. Dispersion of firm growth	↓	↓	↓
4. Job creation	↓	↓	↓
5. Frontier vs. laggard gap	↑	↑	↑
6. Markups	⇔	↑	↑
7. Profit	↑	↑	↑
8. Labor share	↓	↓	↓
9. Concentration	↓	↑	↑

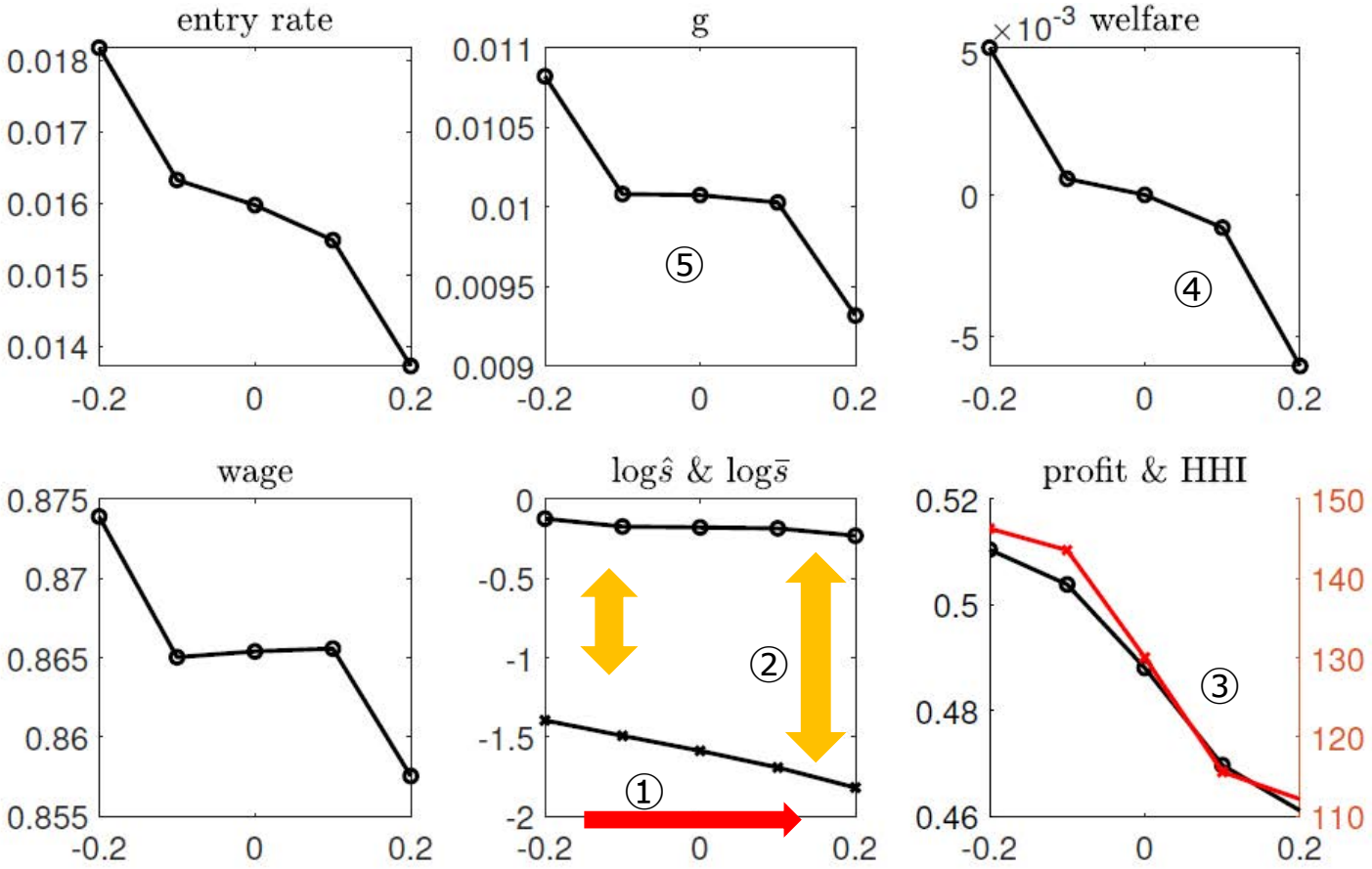
d. 再配分効果②

- *Miyakawa, Ueda, & Oikawa '23*
  - *Hopenhayn & Rogerson '93 w/ endogenous R&D activities*



d. 再配分効果②

- *Miyakawa, Ueda, & Oikawa '23*



e. 内部効果

- *E.g.,* Syverson '11

<Internal>
- Managerial practice/talent
- Higher-quality L & K
- ICT & RD
- Learning-by-doing
- Product innovation
- Firm structure decision

<External>
- Productivity spillover
- Competition
  - Intra-market
  - Trade
- Deregulation, proper regulation
- Flexible labor market

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http://www.aeaweb.org/articles.php?doi=10.1257/jel.49.2.326

What Determines Productivity?

CHAD SYVERSON*

Economists have shown that large and persistent differences in productivity levels across businesses are ubiquitous. This finding has shaped research agendas in a number of fields, including (but not limited to) macroeconomics, industrial organization, labor, and trade. This paper surveys and evaluates recent empirical work addressing the question of why businesses differ in their measured productivity levels. The causes are manifold, and differ depending on the particular setting. They include elements sourced in production practices—and therefore over which producers have some direct control, at least in theory—as well as from producers' external operating environments. After evaluating the current state of knowledge, I lay out what I see are the major questions that research in the area should address going forward.
(*JEL* D24, G31, L11, M10, O30, O47)

1. *Introduction*

Thanks to the massive infusion of detailed production activity data into economic study over the past couple of decades, researchers in many fields have learned a great deal about how firms turn inputs into outputs. Productivity, the efficiency with which this conversion occurs, has been a topic of particular interest. The particulars of these studies have varied depending on the researchers' specific interests, but there is a common thread. They have documented, virtually without exception, enormous and persistent measured productivity differences across producers, even within narrowly defined industries.

The magnitudes involved are striking. Chad Syverson (2004b) finds that within four-digit SIC industries in the U.S. manufacturing sector, the average difference in logged total factor productivity (TFP) between an industry's 90th and 10th percentile plants is 0.651. This corresponds to a TFP ratio of $e^{0.651} = 1.92$. To emphasize just what this number implies, it says that the plant at the 90th percentile of the productivity distribution makes almost *twice* as much output with the *same measured inputs* as the 10th percentile plant. Note that this is the average 90–10 range. The range's standard deviation across four-digit industries is 0.173, so several industries see much larger productivity differences among their producers. U.S. manufacturing is not exceptional in terms of productivity dispersion. Indeed, if anything,

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e. 内部効果

- *Arata & Miyakawa '23*
  - TSR & BvD data (tax data will be used)
  - How about "high growth firms (HGF)"
    - Sudden jump
    - Difficult to predict
    - Implication? (e.g., financing scheme etc.)

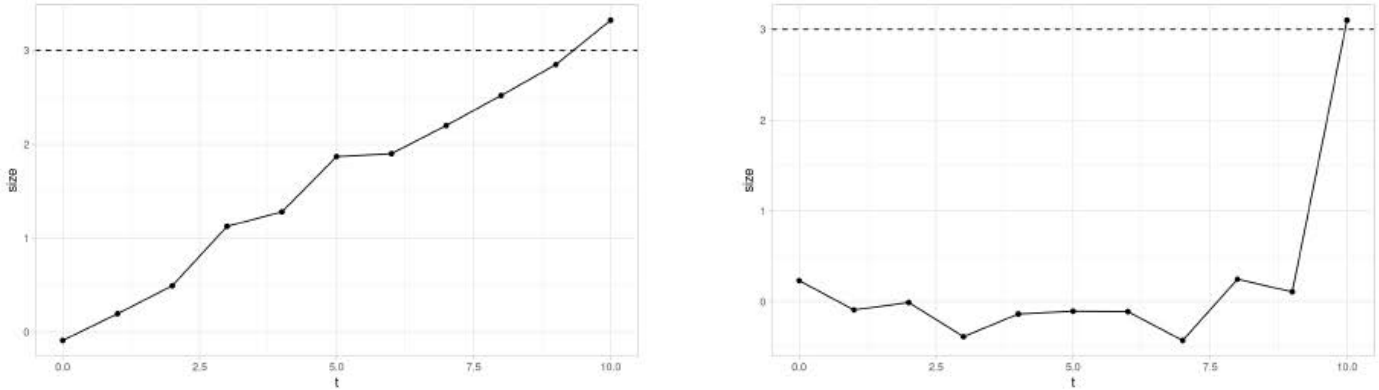


Figure 1: Gradual increase (left) and an increase by jumps (right)

e. 内部効果

- *Arata & Miyakawa '23*
  - Share of first periods contribution: Mountain or U-shape

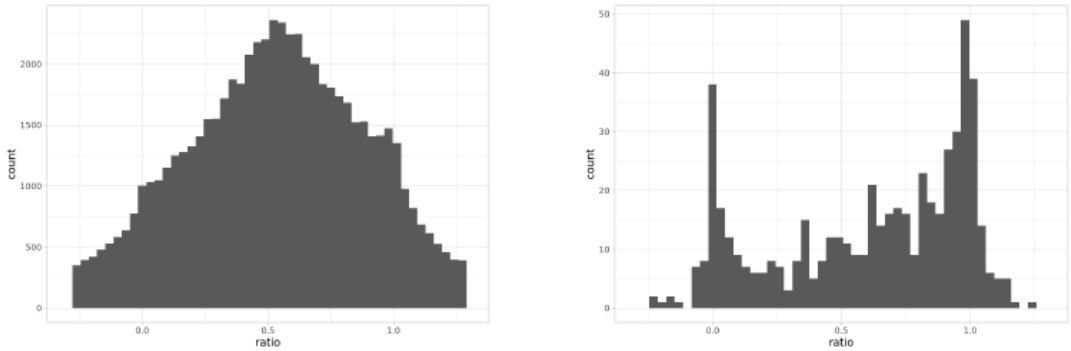


Figure: Histogram of r conditional on $X_1 + X_2 > 0.2$ (left) and > 1.6 (right).

- The same U-shape holds for France and Germany (using Orbis provided by BvD).

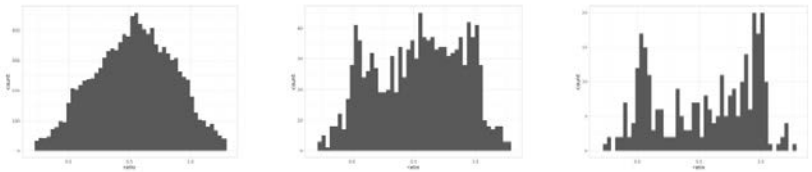


Figure 4: Histogram of r conditional on $X_1 + X_2 > 0.2$ (left), > 0.8 (middle), and > 1.4 (right).

- For France.

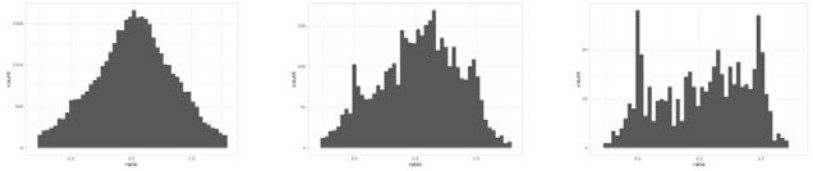
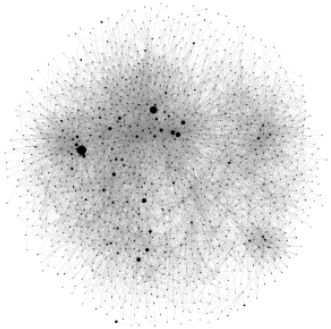


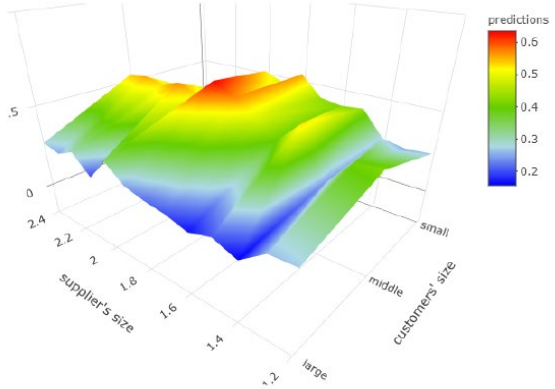
Figure 5: Histogram of r conditional on $X_1 + X_2 > 0.2$ (left), > 0.8 (middle), and > 1.4 (right).

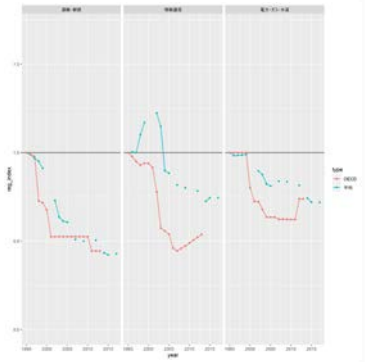
f. まとめ

- 計測結果に基づいた議論の必要性
  - Job-to-job transition?
    - BLS: Current Population Survey (CPS)
    - UC Census: Longitudinal Employer-Household Dynamics (LEHD)
  - Firm-to-firm network
    - *Arata and Miyakawa '22a, '22b*
  - Policy & regulation itself
    - *Miyakawa, Shimamura, and Takizawa '23*



- ガイドとしての理論





- 複数の政策の同時運用

＜連絡先＞

宮川大介（みやかわだいすけ）

教授

一橋大学大学院経営管理研究科（一橋ビジネススクール：HUB）

E-mail: dmiyakawa@hub.hit-u.ac.jp

Web: https://sites.google.com/site/daisukemiyakawaphd/