

令和 6 年 6 月 26 日現在

機関番号：42718

研究種目：若手研究

研究期間：2019～2023

課題番号：19K13714

研究課題名(和文) The Role of Labor Flexibility in the Pursuit of Innovation Strategies: Case of Japanese Telecommunications Industry

研究課題名(英文) The Role of Labor Flexibility in the Pursuit of Innovation Strategies: Case of Japanese Telecommunications Industry

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交付決定額(研究期間全体)：(直接経費) 1,600,000円

研究成果の概要(和文)：革新的な活動がどのように市場価値につながるかという疑問に答えるワーキングペーパーによると、化学や医薬品などの資本集約型産業の研究開発費に高い市場価値を置くことと、他方では、比較的労働集約型の製造業の特許取得済み成果物の品質に報いることの間には境界線があります。新型コロナウイルスの予期せぬ発生により、対面環境と比較して、オンライン環境の生産性が仕事の形式にどのように依存するかという疑問に取り組みました。500人の日本の従業員からの層別アンケート調査の回答に基づいて、オンラインの生産性は対面の生産性と比較して低いと認識されている一方で、大多数の人々はテレワークを継続する意思があるということです。

研究成果の学術的意義や社会的意義

The findings regarding market perception of innovative activities of Japanese companies present valuable insights to shareholders in their evaluation of sector-based returns on investment. In addition, our findings about low collective productivity online can help firms in adapting to future crises.

研究成果の概要(英文)：First, I have published the working paper that answers the question of how innovative activity translates into market value. The main finding is following. There is a dividing line between putting more market value on R&D spending for capital-intensive industries like Chemicals and Drugs on one hand, and rewarding the quality of the patented output for relatively more labor-intensive manufacturing sector on the other. Next, due to the unexpected outbreak of the COVID-19 pandemic, I have embraced the question of how productivity in an online environment depends on formats of work, remuneration systems and socioeconomic factors in comparison to a face-to-face environment. Based on the responses from the stratified questionnaire survey from 500 Japanese employees, the findings of our working paper highlight a "telework dilemma", whereby online productivity is perceived to be low as compared to face-to-face productivity, while the majority of people are willing to continue telework.

研究分野：Labor Economics

キーワード：Industrial Organization Employee Attitudes COVID-19

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## 1. 研究開始当初の背景

While according to the UN 2030 Agenda, decent work is key to sustainable development, working arrangements worldwide, and, hence, the very notion of “decent work”, have undergone noticeable changes. Throughout the last three decades, governments and employers in the OECD states have argued for increased labor flexibility (Franceschi & Mariani, 2015), concurrently promoting innovation policies (De Spiegelaere et al., 2014). Striking a balance between cultivating firm-specific knowledge that is key to innovation and managing a motivated enough external workforce is a challenging task. Notably, the way this trade-off is achieved, depends on the so-called institutional complementarities. As shown by Storz et al. (2014), the employment-related determinants of innovation within the same industry differ significantly in the U.S. and Japan – countries representing different capitalist systems.

Human resources (HR) play a crucial part in setting corporate agenda. Their dual role of assets and constrains has evoked a wide range of managerial scholarship on the link between employment and corporate strategies. Among the most influential approaches to HR is a resource-based view (RBV) of the firm. According to it, the main function of HR is to contribute to a “sustainable competitive advantage” (Wright, 2001, p. 703). On one hand, HR are prone to adjustment based on formulated corporate strategies. On the other, however, HR are not only means to achieve corporate goals, but also a creative asset in itself (Boxall, 1998). Yet, although RBV positions itself as “strategic” when analyzing the HR strategies, it often takes for granted the practice of labor segmentation which is based on employees’ contribution to competitive advantage.

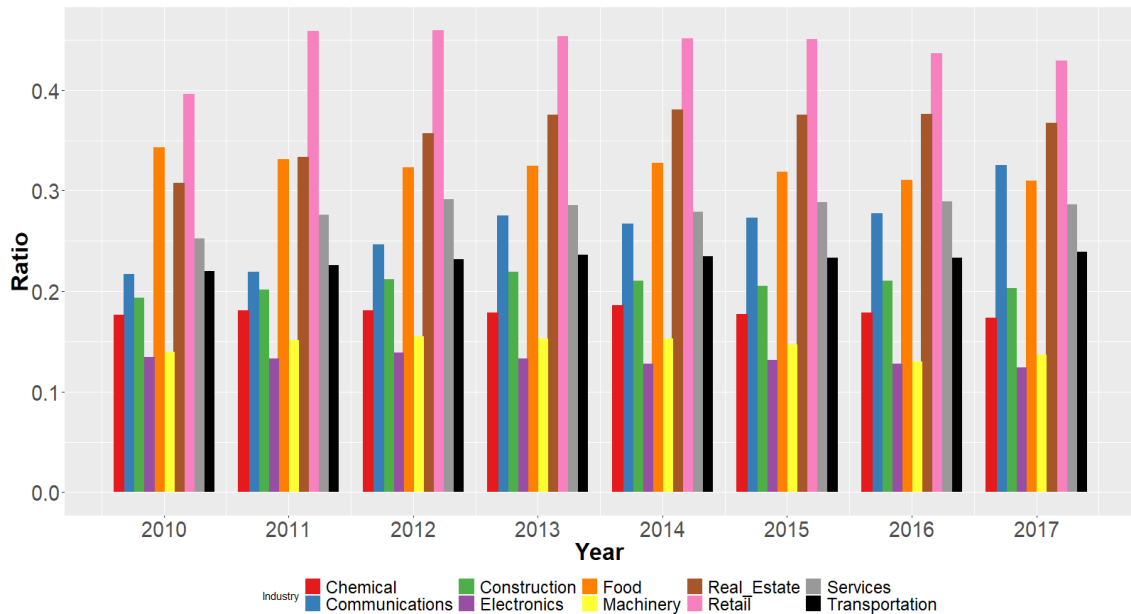
## 2. 研究の目的

This research aims to identify the role of *labor flexibility* in the pursuit of *innovation strategies*. The relevant literature has both recognized the importance of flexible and regular employment. While flexible employees are more likely to be downsized during economic downturns, regular workers contribute to firm’s long-term competitive advantage via the acquisition of unique skills. The current research aims to answer the question about the *optimal balance* between regular and flexible employees that would enhance corporate innovation. The previous studies on this topic have mostly concentrated on the cases of certain European states. Furthermore, Kato & Zhou (2018) have recently conducted the study on Japan’s startup companies. This project intends to analyze the established Japanese telecommunications companies to map the patterns of innovation associated with labor policies.

## 3. 研究の方法

Based on the current state of scholarship, my research has a following significance. From the empirical point (1), it aims at expanding the link between labor flexibility and innovation to different economic contexts and, ultimately, at identifying patterns inherent to CMEs and LMEs. From the theoretical point (2), it intends to finetune the application of the RBV view by identifying the bottlenecks associated with HR strategies. From the policy point (3), it can

suggest more efficient ways of managing firm-specific knowledge, whilst maintaining optimal levels of labor flexibility. For example, it can specify adversities associated with overreliance on nonregular workforce that impede innovation strategies.



*Figure 1: Average yearly ratios of nonregulars*

*Hypothesis:* the correlation between numerical labor flexibility and the number of patent applications has either a negative or an inverted U-shaped relationship for the Japanese telecommunications industry.

This assumption is based on the findings of Kato & Zhou (2018) for the startup Japanese firms. There is likely to be an optimal point for the regular employees' external turnover that would enhance firms' resources from the RBV view. This optimal point is supposed to represent the turnover ratio for regular employees sufficient for accumulating critical amount of firm-specific knowledge. The same logic about temporary employment being beneficial to innovation as long as it constitutes a motivated reserve, having chances to acquire regular status and not regarded merely as means to minimize labor costs.

*Data:* Nikkei NEEDS Database; Institute of Intellectual Property Patent Database by Goto & Motohashi (2007).

### **Variables**

*Dependent variable:* number of patent grants and patent citations

*Independent variables:* external labor turnover of regular employees; proportion of nonregular employees.

*Control variables:* R&D intensity; size of the firm; age of the firm

#### 4. 研究成果

- Ovsianikov, K. (2020). Does Tokyo Stock Exchange Appreciate Corporate Innovations? Role of Patents' Quality and Research Productivity. *SozArXiv Papers*.

In spite of the long legacy of the related scholarship, my research stands out for at least three reasons. First, it fills the gap of consistently under-representing Tokyo Stock Exchange, the third-largest stock market in the world. Second, it highlights the issue of institutional change, whereby a coordinated industrial system becomes more susceptible to market influence. Third, it implements novel computational techniques for demonstrating nonlinear tendencies existing between the innovation-related predictors and the Tobin's  $q$ .

My first hypothesis deals with the input-side of technological innovations and their underlying institutional features. In this respect, alone the affiliation with the Pharmaceutical industry serves as a positive *ex ante* signal to the market. In addition, Drugs are the most R&D-intensive sector analyzed, which explains the relative importance that market places on its R&D stocks. It also allocates a relatively high premium for the surge in the R&D spending among Chemicals that share similar characteristics with Pharmaceuticals. Thus, in case of these industries, input-based innovation variables largely stemming from institutional features play a significant role for investors even amid the intensified market competition. Institutional background also plays an important role for the manufacturing sector, which becomes apparent upon the inclusion of control variables.

My second and third hypotheses deal with the output-side of technological innovations. This aspect is related to the ability of successfully waging open-market competition. First, innovative productivity measured as the "Patents per yen spent on R&D" is only appreciated by the market in case of the Chemical industry.

Second, this rather unexpected result becomes clearer when additionally controlling for patents' quality measured as "Citations per Patent". This variable plays a significant role for the market perception of Japan's manufacturing innovations overall, plus for investors' appreciation of relatively highly-cited Pharmaceutical and Chemical inventions. In this respect, one observes the dividing line between putting more emphasis on R&D spending for capital-intensive industries like Chemicals and Drugs on one hand, and rewarding the quality of the patented output for relatively more labor-intensive manufacturing sector on the other. When imposing additional restrictions, however, R&D spending appears to be an important innovation marker for Electronics and Machinery as well.

In a nutshell, while institutional features associated with R&D expenditures still provide valuable signals for investors across multiple industries, quality of a patented output mostly matters for the manufacturing sector. On a separate note, this paper identified a pronounced

nonlinear trend in the market perception of corporate age, whereby only the more experienced companies receive market premium as they get older (see Figure 2).

- Ovsianikov, K., Kotani, K. & Morita, H. (2022). Online Productivity and Types of Assignments in a Japanese Workplace. *Social Design Engineering Series* (SDES-2022-5).

Due to the unexpected outbreak of the COVID-19 pandemic, me and my research collaborators have embraced the question of how productivity in an online environment depends on formats of work, remuneration systems and socioeconomic factors in comparison to a face-to-face environment. Our paper shows that, according to employees' perceptions, *collective productivity* in an online environment has noticeably deteriorated as compared to a face-to-face format, especially when carrying out creative tasks. Whereas existing studies have pointed out this problem by focusing on industrial and individual levels, our research is novel for demonstrating that the main challenge of maintaining online performance on a par with or above the face-to-face benchmarks is related to quality and efficiency of shop-floor communication.

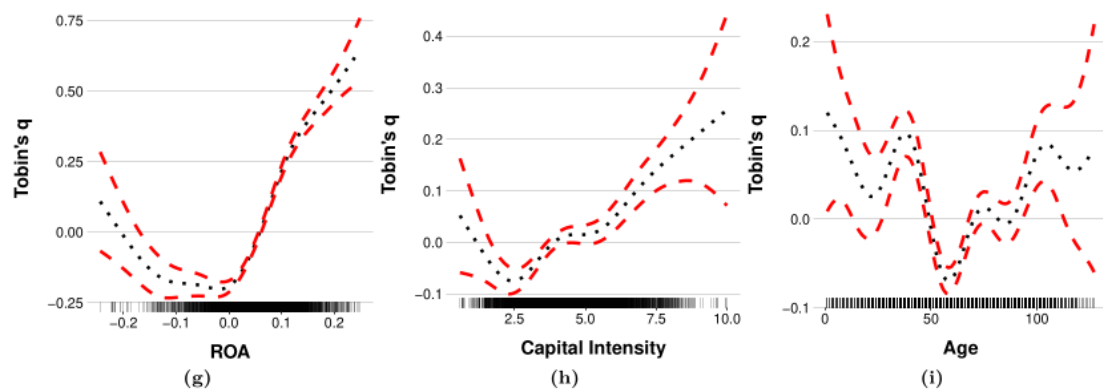


Figure 2: Visualizations of GAMs relationships

Team operations involve a subtle set of interpersonal qualities that are incrementally building up in a face-to-face environment, embodying the tacit dimension. On one hand, upon the rapid implementation of telework, due to the impact of such external shocks as COVID-19, codified operations can be replicated online under the proper technological maintenance. On the other hand, tacit interactions become inevitably devaluated or void. As it is impossible to directly operationalize tacit knowledge, which lays at the core of intra-group cohesion, we use the “seniority-merit” wage system (年功序列) as its proxy. For the 年功序列 employees, organizational commitment is loosely linked to explicit criteria, and is rather embedded in a long-term employee-firm nexus that is based on mutual loyalty and trust. This cohort of workers habitually prove their value through a series of shop-floor interactions -- beyond the scope of prescribed duties. Naturally, such tacit ecosystem is likely to crumble once its nodes become physically disconnected.

5. 主な発表論文等

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6. 研究組織

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7. 科研費を使用して開催した国際研究集会

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国際研究集会 Populism in Regional Japan: Where is the "Revenge of the Places That Don't Matter"? Universitaet Wien	開催年 2021年～2021年
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8. 本研究に関連して実施した国際共同研究の実施状況

共同研究相手国	相手方研究機関
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