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主 論 文 題 名 : Essays on Firm Heterogeneity and Heterogeneous Effects of Economic Policies				
(内容の要旨) This Ph.D. thesis consists of an introduction chapter and four essays on firm heterogeneity and heterogeneous effects of economic policies. In the conventional view of economics, firms, plants, or other kinds of production units are considered to be homogeneous. They are assumed to produce a homogeneous product using the same constant-returns-to-scale technology in a perfectly competitive market. In this setting, firms face the same input prices and impose the same price on the product. This is quite different from the real world. The firms are producing differentiated products in different locations, using different technologies even within narrowly defined industries. The extremely simplified setting is used when the studies focus on the issues not closely related to firms. Many studies related to firm issues assume that the firms produce differentiated goods and operate in the monopolistically competitive market. While the setting is more realistic, the underlying firm-level parameters like productivity are assumed to be constant across firms. As a result, their activities are similar to each other and they uniformly change their activities in response to the changes in economic environment. While the simple setting is valid if the use of more complicated but realistic settings does not change the major results quantitatively and qualitatively, we should investigate to what extent the results are affected and what kind of changes would be observed when we explicitly consider firm heterogeneity in terms of their productivity and other parameters. The objective of the thesis is twofold. First, I explore heterogeneity across firms and plants and estimate the effects of heterogeneity on the aggregate economy. In particular, I focus on the effects of heterogeneous productivity, markup, and factor price distortions on the resource misallocation across producers. I address this issue in Chapters 2 and 3. In these chapters, I mainly quantify the effects of resource misallocation as the change in aggregate productivity when resource is appropriately reallocated. I also explore the roles of uncertainty as a cause of misallocation across producers in Chapter 3. Second, I investigate the heterogeneous effects of economic policies and institutions, related to firm heterogeneity. This issue is addressed in				

Chapters 4 and 5. More specifically, I focus on the effects of minimum wage in Chapter 4 and Free Trade Agreements (FTAs) in Chapter 5 as examples of the economic policies. The main finding of the thesis is that heterogeneity across firms and plants is large and it largely affects the performance of the aggregate economy. It is also found that the variations in the effects of the economic policies are large and those heterogeneous effects are attributed to the heterogeneous producers to some extent.

Chapter 1 is the introduction of the thesis. In the chapter, I first explain heterogeneity of producers as the main topic connecting the chapters of the thesis. Then I summarize the literatures of methodological issues and implications of large firm heterogeneity. The estimation of firm-level parameters is required to consider the effects of firm heterogeneity. The progress of the method to estimate the production function at firm level is, therefore, closely related to the thesis. I also take some examples for the heterogeneous effects of the economic policies. The heterogeneous effects can be attributed to the heterogeneity of producers at least to some extent. Finally, I summarize the methods and the main findings of each chapter.

In Chapter 2, I explore the resource misallocation across Vietnamese manufacturing firms. The framework of Hsieh and Klenow (2009) is applied to measure the degree of resource misallocation to compare it with other Asian countries. Hsieh and Klenow (2009) construct a tractable model to estimate the distortion of output price and factor prices. In their model, Cobb-Douglas production function and demand function with constant elasticity of substitution are imposed. Under these assumptions, appropriate reallocation of inputs across firms would increase aggregate productivity if Revenue-based Total Factor Productivity (TFPR) is different across firms. This result implies that the dispersion of TFPR can be interpreted as a measure of resource misallocation across firms. Hsieh and Klenow (2009) compare the resource misallocation in the U.S., China, and India. Using their results and other studies using the same framework, I compare the degree of resource misallocation in Vietnam with other Asian countries. As a result, the resource misallocation in Vietnam is comparable to China, India, and Thailand, and larger than the U.S. and Japan. In addition, the simulation results show that the aggregate productivity would rise by 30% if the allocative efficiency of Vietnam is improved to the level of the U.S. Finally, I explore the change in firm size distribution when market distortion is totally removed. The simulation result shows that large firms are facing to disadvantageous distortion and those firms would be larger if they were equally treated in the market. On the other hand, small firms face advantageous distortion and they would be smaller if the resources are

appropriately allocated.

In Chapter 3, I focus on the effects of uncertainty and competition on the allocative efficiency, using a large panel dataset of manufacturing plants in Japan. In general, uncertainty reduces irreversible investment. This effect is related to capital misallocation across plants because the plants facing large uncertainty do not undertake enough investment even when their productivity levels are largely deviated from the optimal levels in terms of static view. This mechanism is suggested by Asker, Collard-Wexler, and De Loecker (2014). I first measure the degree of capital misallocation and volatility at industry-year level. The degree of capital misallocation is defined as the dispersion of marginal revenue productivity of capital. Volatility is defined as the dispersion of the change rates in plant-level productivity within industry. I found a positive relationship between volatility and capital misallocation. This result implies that the plants do not adjust their capital inputs to the optimal levels immediately. I also investigate the role of competition in the relationship between uncertainty and misallocation. Theoretically, the effect of uncertainty on misallocation depends on the degree of market competition. I explore the roles of competition in the simulation analysis and estimate the effects of competition on the relationship between uncertainty and misallocation. It is found that the effect of uncertainty is larger if the output market is more competitive. The results of the structural estimation and simulation analysis show that the aggregate productivity increases by 0.7% on average for all industries if the volatility of TFPR shocks reduces by half. For more competitive industries, the effect on the aggregate productivity is as high as 2.1%.

In Chapter 4, I focus on the labor market and explore the heterogeneous effects of minimum wage, using Japan's plant data. While previous studies have reached little consensus on the employment effect of the minimum wage, the effect theoretically depends on the monopsonistic power of the producers in the local labor market. In the chapter, therefore, I first estimate the monopsonistic power of plants by applying the methods of estimating the production function and markups. Monopsonistic power or surplus in the local labor market is defined as a function of output elasticities with respect to intermediates and labor and the shares of intermediates and labor to sales. Then I estimate the employment effects of minimum wage by monopsonistic power in the local labor market. I found the negative effects of minimum wage when all plants are included in the sample. But the impact of the minimum wage is concentrated in specific markets. The employment effect of an increase in the minimum wage is significantly negative for the plants with little surplus in the local labor market. The minimum wage increases have

little employment effect on plants with a relatively high surplus, even when they have a significant number of minimum wage employees.

In Chapter 5, I investigate the heterogeneous effects of FTAs. While FTAs have positive effects on the bilateral trade values by reducing trade costs, Baier, Bergstrand, and Clance (2018) and Baier, Yotov, and Zylkin (2019) found that the trade creation effects of FTAs have a large variation across agreements or country pairs. I focus on the trade creation effects of Japan's FTAs and its variation across partner countries using bilateral trade data. I also estimate the gravity model specified in many ways and compare the results with the most reliable specification. The main finding is that the effects of Japan's FTAs are not clearly observed when the gravity model is specified with three types of fixed effects, i.e. exporter-year fixed effects, importer-year fixed effects, and country-pair fixed effects. In fact, the effects of FTAs vary substantially among trade partners and around half of the FTAs increase Japan's trade values. The estimation results also suggest that FTAs with small trade partners tend to have large effects on Japan as well as other countries. Recently enforced FTAs, however, increase Japan's import values more rapidly. In this chapter, I focus on the heterogeneous effects across country pairs instead of producers due to the data restriction. But some of the differences in the effects of FTAs must be attributed to firm heterogeneity because the changes in the numbers of exporting firms play important roles to explain the changes in bilateral trade values.