

論文の内容の要旨

論文題目 Functional Specialization of Cities

(都市の機能的特化)

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My dissertation focuses on functional specialization of cities, a modern, increasingly important form of a system of cities, in which new technologies and varieties of goods and services are developed in larger cities with the help of greater urban diversity and positive externalities, while in smaller cities production based on technologies developed in the former cities are conducted, often characterized as less skill-intensive, more routine economic activity (Duranton and Puga, 2005).

Except for the concluding chapter, the dissertation consists of three chapters, each corresponding to an independently readable paper. In Chapter 1, a model of a system of cities is developed in order to formalize the mechanism behind functional specialization of cities and then consider welfare implications of income redistribution across cities. Then, in Chapter 2, an implication of the specialization for income inequality (skill premium) is investigated using a two-region model, which can be viewed as a simplified and modified version of the model in the previous chapter more suitable for analysis of skill premium. In Chapter 3, functional specialization of cities is interpreted as team production, production by organizations with high-skilled managers supervising low-skilled workers at the top, and policy implications are investigated, especially focusing on the allocation of creativity in light of the increasing importance of knowledge and creativity in overall economic activity.

The followings are slightly more detailed summaries of the chapters.

Chapter 1: A Simple Model of Functional Specialization of Cities

This chapter develops a static equilibrium model of a system of cities in which ex ante identical locations specialize in stages of production different in the degree of dependence on routine and nonroutine local services sectors, the latter of which is tied to an agglomeration force due to (Dixit-Stiglitz type) monopolistic competition. The model is simple in that the system is summarized by a second-order difference/differential equation, which has a unique non-degenerate city size distribution with the comovement of income, population, factor prices, and urban diversity as observed for the U.S. cities.

The model is an extension of Matsuyama's (2013) to an urban context, and circular causation is the key mechanism that induces a market equilibrium to exhibit functional specialization of cities. If stages of production which demand for nonroutine services more than the other stages concentrate in a particular location, then a large number of differentiated firms enter the local nonroutine services sector there. Since the larger number of varieties reduces the price index of non-routine services in that location, the concentration of stages with higher skill intensities strengthens further.

Due to this circular causation, a market outcome results in an inefficient allocation (Matsuyama, 1995). In this sense, the modeling approach is in contrast to standard urban economics

models of a system of cities à la Henderson (1974) and Black and Henderson (1999) including Duranton and Puga's (2005) model of functional specialization of cities, where a market allocation is efficient thanks to the existence of an institution, e.g., competitive city developers, that fixes sources of inefficiency.

Therefore, this chapter considers a simple income redistribution policy as a tool that corrects inefficiency to some extent. Although introducing income redistribution makes the model analytically intractable, a market equilibrium is still characterized by a difference/differential equation easily solved with a numerical method and thus useful for further analyses.

Chapter 2: Comparative Advantage and Skill Premium of Regions

This chapter provides one explanation for why a positive correlation between the size and skill premium of a region emerges by providing a comparative advantage model with a continuum of mobile heterogeneous individuals as well as a continuum of final goods sectors that are different in terms of their skill intensities of intermediate goods. All individuals choose their occupations depending on their productivity, and any occupation can freely migrate across regions. This location-occupation choice then interacts with the regional comparative advantage in final goods sectors which depends on the regional offer prices of two different types of intermediate goods, one of which features (Dixit-Stiglitz type) monopolistic competition. Although regions are ex-ante identical, interactions between individuals' location-occupation choices and regional comparative advantage result in a self-organized positive correlation between the skill premium and income of regions. The theory can also accommodate the interpretation that the regional difference in skill premium is caused by specialization in task trade within firms, not industries.

The crucial difference of the model in this chapter from that in the previous chapter is that there is individual heterogeneity: individuals are heterogeneous in productivity of producing a differentiated good. Given that the specification follows Melitz (2003), the model can be viewed as an extension of Matsuyama (2013) to a class of heterogeneous agents. In the model, circular causation is again the key mechanism that induces a market equilibrium to exhibit a positive correlation between the size and the skill premium of a region. In this sense, the current approach, i.e., functional specialization of cities, differs from Davis and Dingel (2012) who resort to knowledge spillover as a mechanism of the concentration of economic activity.

Chapter 3: Team Production and the Allocation of Creativity across Global and Local Sectors

This chapter develops a two-sector Ricardian comparative advantage model with team production in order to obtain implications for policies encouraging team production in a sector with only low-skilled agents to attract high-skilled agents to that sector. It is shown that team production changes the nature of comparative advantage, providing a policy device for attracting creativity. It is also shown that policy targets, reducing cost of communication within teams, reducing cost of learning within team, and increasing productivity gain from such learning, should be carefully selected because likelihoods of success in attracting creativity are different across the targets, and they exhibit some non-monotonicity in the dynamics in the allocation of creativity.

The model is based on team production models developed by Garicano and Rossi-Hansberg (2006a,b) who investigate how knowledge is used in the economy especially focusing on the emergence of organizations. Similar to models of functional specialization of cities including Duranton and Puga (2001) and Duranton and Puga (2005), there is an equilibrium where some location specializes in skill-intensive economic activity, while the other specializes in less skill-intensive one. Unlike these studies, the primal focus of this chapter is on comparative statics of the allocation of skilled agents with respect to policy-related parameters.

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