

論文 / 著書情報
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著者(和文)	KIMKyungtaek
Author(English)	Kyungtaek Kim
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論文要旨

THESIS SUMMARY

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学生氏名： Student's Name	キム キョンテック KYUNGTAEK KIM		指導教員 (主)： Academic Supervisor(main)	屋井 鉄雄 TETSUO YAI	
			指導教員 (副)： Academic Supervisor(sub)		

要旨 (英文 800 語程度)
Thesis Summary (approx.800 English Words)

This study aims to estimate business interactive accessibility (BIA) by high-speed rail (HSR) of Japan. BIA is the potential of business interaction and sub-sector of accessibility. Accessibility indicators of previous studies represent the general economic potential, so they are insufficient to explain BIA. To estimate the BIA, this study develops a new index, named as the Densely-Buoyant District index (DBD).

DBD consists of four variables showing two socio-economic conditions and two economic subjects of worker and firm. Two socio-economic conditions are business scale and distance between firms within a region. The former represents the internal economies of scale, and the latter describes the agglomeration economy. The DBD is based on the concept of worker visiting firms within a region and between regions. Therefore, the DBD represents how much a district has potential business interaction.

Chapter 2 discuss the impact of HSR, proposed by previous studies and compare the characteristic of HSR operation in the world. The research outcomes of previous studies about the impact of HSR are classified into the first-order effect (accessibility, land-development, passenger travel), second-order effect (regional productivity, economic activities, residents), collateral effect (agglomeration effect, straw effect), and exogenous factors (urban scale, supportive policy), regional inequality, and transport modal share to emphasize the distinctive points of the impact of HSR.

Chapter 3 discusses the characteristic of DBD and examine the impact of DBD by HSR at the prefecture-level. First, compared to other accessibility indicators, DBD by inter-prefecture transportation emphasizes the importance of proximity to Tokyo and Osaka and the major prefecture in each region. Second, to examine the utility of DBD by HSR at the prefecture-level of Japan, a production function including the DBD, the prefecture-fixed effect, and the year-fixed effect is analyzed. The result suggests that DBD enhanced by HSR increases regional productivity. The DBD of the secondary industry and tertiary industry especially enhances regional productivity, while DBD of the primary industry is inversely related to productivity.

Chapter 4 investigates the characteristic of DBD by HSR at the micro-level (mDBD) and the impact of mDBD on the research-district. First, to examine the characteristic at the mesh-level, a cluster analysis is conducted. Input variables for the cluster analysis include mDBD, firms, workers, population, a straight-line distance travel time to the closest HSR station, and the number of bus lines, and railway stations within a radius of 500m. Four clusters are detected. Cluster 1 and 2 show the highest and second-highest mDBD respectively. These two clusters show the urban area of the city. Second, the impact of mDBD by HSR on the development of the research-district is examined. Each district having the research institute is classified into three levels: primary-research district, major-research district, and core-research district. The ordered logit model is analyzed by considering the factors of the mDBD, HSR station area, railway station area and other variables. The result suggests that an increase in mDBD enhances the odds of being a higher-level research district, at the district within the 5km HSR station and 500m, 1km 1.5km railway station radius.

Chapter 5 examines the impact of DBD by HSR on productivity at the prefecture-level (pDBD). It is required to examine the relationship between DBD and actual business travel. However, there is a data limitation at the micro-level. To address this limitation, pDBD is estimated by mDBD through the spatial aggregation, then the relationship between pDBD and business travel at the prefecture-level is examined. First, the gravity model shows that pDBD attracts more business travel. This result indirectly explains the relationship between mDBD and business travel. Second, to investigate the characteristic of the impact of pDBD, the marginal productivities of pDBD and business travel is estimated by using the production function. The result first suggests that the small-and intermediate prefectures are more sensitive to the increase in pDBD than the metropolitan regions. Second, an investment in HSR, which increases pDBD may reduce the regional imbalance between regions connected by HSR. Third, the minimum requirement for pDBD should be at first achieved. Last, considering the elasticity of substitution between pDBD and business-travel, increasing pDBD and business travel in the small-and intermediate prefecture is more required than focusing on the metropolitan regions.

To sum up, this study provides four major points. First, the spatial aggregation from the micro-level to the macro-level can be applied when considering two different spatial levels simultaneously. Second, DBD by HSR shows that a higher DBD value attracts more business travel. Third, at the micro-level, the urban center and urban area of the large city and small-and intermediate-city are detected by the mDBD by HSR. Last, an investment in BIA by HSR of the small-and intermediate prefectures is required, to reduce regional inequality.

(775 words)

備考：論文要旨は、和文 2000 字と英文 300 語を 1 部ずつ提出するか、もしくは英文 800 語を 1 部提出してください。

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