様式Ｃ－１９

科学研究費助成事業（科学研究費補助金）研究成果報告書

研究成果の概要（和文）：
このプロジェクトの目的は地域経済動学におけるひとつの理論を構築することである。この研究の特色は、輸送コストと技術的変化から経済地理学を研究するばかりでなく、資本蓄積をも理論に取り入れていることである。空間的な経済学の包括的理論を構築するためにはまだ数年必要となるが、このプロジェクトはアグロメレーションとエクスターナリティを備えた一般的な地域間および国家間の経済理論を構築することに成功した。

研究成果の概要（英文）：
This project developed a theory of interregional economics. A unique feature of project is that the theory not only studies economic geography with transportation costs and technological change, but also introduces capital accumulation into the theory. Although it will still require some years to complete the goal of building a comprehensive theory of spatial economics, this project succeeded in building a general interregional and international economic theory with agglomeration and externalities.

交付決定額

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研究分野：社会科学
科研費の分科・細目：経済学・応用経済学
キーワード：Spatial agglomeration; Interregional growth; Public good; Residential location; Fiscal policy; Monetary policy

１．研究開始当初の背景

Two of the most salient features of the geography of economic activity are complicated interdependence and concentration. As more countries are joining globalizing processes in various fields, the world is economically so closely connected that changes in any economy may have significant global effects. On the other hand, these increasingly complicated interactions have not led to international as well as interregional harmonization. Over the course of economic development, the patterns of regional agglomeration have become more pronounced: different regions grow at differential rates, and a

few metropolitan areas continue to attract people while others remain stagnant or even witness decline in their population figures. It is observed that the large disparities between rich and poor regions are recent. It is important to study why and how they change over time. Recent literature on economic geography formalizes such cumulative processes in models based on increasing returns to scale. The strong positive correlation between industrialization and geographic clustering of economic activities has been observed by empirical studies as well. The significance of studying spatial patterns of industrialization and agglomeration has been well accepted. Nevertheless, as observed by Fujita and Thisse, "because both agglomeration and growth are complex phenomena in themselves, one should expect any integrated analysis to face many conceptual and analytical hurdles. Not surprisingly, therefore, the field is still in its infancy and relevant contributions are not so many."

２．研究の目的
The purpose of this project is to develop a theory of interregional economics, based on the new economic geography with agglomeration and growth theories. Not only this, I also introduce heterogeneous households into the regional growth model. A unique feature of this project is that the theory not only studies economic geography with transportation costs and technological change, but also introduces capital accumulation into the theory. It is well known that few interregional models include capital accumulation – this is another challenging task which has not been emphasized in the current literature. The project develops an interregional economic theory of income and wealth distribution with money, capital accumulation, agglomeration and returns to scale, which can more effectively explain, than the traditional approaches, why and under what conditions regional discrepancies widen or fall or become stationary over time.

３．研究の方法
The project built an analytical framework, which takes account of complicated interactions among various forces of economic geography. The theory deals with interactions among money, endogenous capital, human capital, population movement, transportation, economic structure and transportation costs in a consistent framework. The project synthesized multiple forces emphasized in different economic theories within a united framework.

４．研究成果

This project developed a theory of interregional economics. A unique feature of this project is that the theory not only studies economic geography with transportation costs and technological change, but also introduces capital accumulation into the theory. Although it will still require some years to complete the goal of building a comprehensive theory of spatial economics, this project succeeded in building a general interregional and international economic theory with agglomeration and externalities.

The project published 6 articles in peer-review journals and participated in 8 international conferences (presenting one paper in each conference). In particular, my paper at the AABRI was awarded *the Best paper of the Conference.*

I now briefly describe the 6 papers published in peer-review journals. Article ⑥ introduces externalities and congestion associated with public goods into a small-open economy with multiple regions. It shows how agglomeration occurs under different fiscal policies. Based on Article ⑥, Article ⑤ builds a two-regional growth model with capital accumulation, endogenous time distribution between leisure and labor, and regional public goods with fiscal policies. I emphasize dynamic interactions among capital accumulation, externalities, supply of public good with different fiscal policies, congestion of public good, endogenous time, and economic geography. The economy consists of two regions and each region consists of the industrial sector and public sector. First, I develop the two-region growth model with public goods and fiscal policies. Second, I show how to find equilibrium values of the dynamic system. Then, we simulate model with specified parameter values. Finally, I carry out comparative statics analysis with regard to parameter changes in tax rates and congestion. Our comparative statics analysis provides some important insights. For instance, a main difference between the effects of increasing the two regions' tax rates on the output is that as region 1's (2's) tax rate on the industrial sector is increased, the national industrial output, national capital employed by the economy, and the national wealth are increased (reduced). Article ④ develops a general dynamic equilibrium model with housing market and fiscal policies. I am concerned with an isolated economy with economic geography, local public goods and capital accumulation. Labor supply is elastic and the economy supplies industrial goods, housing services, and local public goods. The model is constructed on the basis of the Solow growth model, the Alonso urban model, the

Muth housing model, and some ideas in the recent literature of public economics with an alternative approach to household. I first examine the dynamic properties of the economic system. I then simulate the model to demonstrate dynamic interactions among economic growth, housing market, residential distribution and public goods over time and space. Article ③ deals with issues related to global economic growth with capital accumulation and knowledge creation. Trade patterns among countries are determined by free competition and knowledge accumulation is through learning by doing. Knowledge is treated as a public good. Knowledge is accessible to all the people in the world, even though different countries apply knowledge differently. The countries differ in preference (such as propensities to save), knowledge utilization efficiency and creativity. First, I show that the dynamics of the J-country world economy is described by (J+1)-dimensional differential equations. Then, I simulate the motion of the global economy with three economies, respectively called developed, industrializing, and underdeveloped economies (DE, IE, UE). I carry out comparative dynamic analysis with regard to changes in knowledge utilization efficiency, research policies, propensities to save, and the populations. I show that, for instance, when the DE strengthens its research policy, all countries benefit; when the UE strengthens its research policy, the UE suffers and the DE and IE benefit. Similarly, when the DE increases its population, all the countries benefit; when the UE increases its population, the UE suffer and the IE and UE benefit in terms of the wage rates, per capita wealth and consumption levels. Article ② proposes a spatial model to examine dynamic interactions among growth, economic geography, housing market, and public goods in a small-open economic growth model. I emphasize the impact of transport, land and fiscal policy on the spatial economy. The economy consists of the industrial sector, housing sector and local public goods. The model synthesizes the main ideas in the neoclassical growth theory, the Alonso urban model, the Muth housing model within the neoclassical open-small growth framework. I solve the dynamics of the economic system and simulate the model to demonstrate dynamic interactions among economic growth, housing market, residential distribution and public goods over time and space. My simulation demonstrates, for instance, as the tax rate on the land income is increased, the total capital stocks and the stocks employed by the housing and public sectors are increased, the land devoted to local public goods falls and the land rent and housing rent rise over space, the consumption level of the industrial goods and the total expenditures on the public goods are increased. My integrating model provides some new insights which cannot be obtained from the component models. Article ① deals with international economic interactions with capital accumulation, economic structure and international trade by integrating the three well-known Solow growth model, Uzawa's two-sector model, and the Oniki–Uzawa trade model within a comprehensive framework. We show that the dynamics of the J-country world economy can be described by J differential equations. The simulation results demonstrate that, for instance, as the underdeveloped economies (UE's) population is increased, the rate of interest, the global capital, output and consumption are increased; the total capital stocks employed by the UE and the capital stocks by the UE's two sectors are all increased; the total capital stocks employed by the (industrializing economy) IE and (developed economies) DE and the capital stocks by the two economies' two sectors are reduced; the per-capita wealth, per-capita consumption levels of services and industrial goods are all reduced in the UE; the per-capita wealth, per-capita consumption levels of services and industrial goods are slightly affected reduced in the IE; and the per-capita wealth, per-capita consumption levels of services and industrial goods are all increased in the DE.

５．主な発表論文等
（研究代表者、研究分担者及び連携研究者には下線）

〔雑誌論文〕（計 6 件）
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