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主 論 文 の 要 旨

論 文 題 目 Intergenerational Conflicts over Welfare and Growth:
Policy Effects of Education and Public Pensions in OLG Frameworks

(経済厚生と経済成長をめぐる世代間利害対立
——世代重複モデルにおける教育と公的年金の政策効果)

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論 文 内 容 の 要 旨

Background

Pensions and education, as two representative issues that reflect intergenerational, social, and economic conflicts between young and old generations, are tightly connected to the two great social themes of current global economics: population aging and economic growth.

On the one hand, population aging has becoming a significant global issue. In response to this problem, more and more countries and regions have begun to establish or complete the implementation of pension systems. At present, the pay-as-you-go (PAYG) pension has become one of the main types of pensions that has been introduced (totally or partially) in many countries, including the United State, the United Kingdom, Japan, and Germany. However, despite the declining birthrate and an aging population, a PAYG pension system exacerbates governments' fiscal burden and many countries have started to consider pension reform.

On the other hand, ever since Schultz (1960, 1961), the role of human capital in economic growth has been widely studied by economists, based on the fact that in reality, the recent economic growth not only relies on physical capital as in the past, but is also driven by human capital. As the main source of human capital, education—public education or private education, intergenerational education or self-education—has been attributed great importance for both individuals and countries.

This dissertation, therefore, concentrates on the two representative issues of intergenerational conflicts, pensions and education, in the framework of an overlapping

generations (OLG) model. We study their effects on welfare or economic growth from different perspectives in different frameworks. We consider three topics: 1) to reconsider the PAYG pension from the perspective of transitional effects, 2) to evaluate the policy effects of a fully funded pension when individuals make a trade-off between educating themselves and educating their children, and 3) to analyze the effects of a coordinated capital tax reform across countries where capital taxes finance public education.

Chapter 2

Specifically, Chapter 2 analyzes the effects of introducing a PAYG pension system on the welfare of transitional generations in an OLG model. We show that along the transition path, a PAYG pension can improve welfare even under dynamic efficiency, whereas it can reduce welfare even under dynamic inefficiency. These effects differ from those for the long run, that is, at the steady states. For comparison, we show that a fully funded pension has no effect on welfare either in the steady states or in the transitional states (when there is an interior solution).

Since the OLG model was constructed by Diamond (1965), many researchers have used this model to investigate the effects of various fiscal policies on social welfare from a dynamic perspective. However, most of the existing analyses focus only on steady-state effects, thus excluding transitional-state effects (e.g., Bewley, 2009). The transitional effects have not been examined because of the complexity of the calculations, which leads to difficulties in determining the economic implications. Following Cremers and Sen (2008), Kuhle (2014) extended the algebraic analysis of the effect of international transfers to encompass the investigation of the effects of general fiscal policies. Kuhle (2014) developed a method to Pareto-evaluate the dynamics of utility along the transition path between two competitive steady states before and after a one-time permanent policy change.

In this chapter, we introduce a simpler and clearer method for obtaining the solution of the difference equation system or the values of variables in transitional states. We show that the effects of a policy change on utility along the transition path are a weighted average of the marginal change in utility of the initial period and that of the steady state. Further, we generally examine the local dynamics of utility in the case where the steady-state equilibrium is oscillatory in a stable manner. By doing this, we show how a policy change affects social welfare in the short and long runs, and demonstrate that there could be a turning period along the transition path before and after which generations experience opposite utility changes. Therefore, the government should judge and weigh the short- and long-run effects when making policy decisions.

Then, applying the above analytical method, we examine a PAYG pension system. We investigate how a change in the pension policy affects welfare in transition, as well as in the steady state. We can easily confirm that the welfare changes in transitional states can be represented by the weighted average of the welfare effects in the initial state and in the steady state. Further, when it becomes possible to consider the welfare effects of a PAYG pension in transition, these should be investigated, not only in the case of monotonic convergence, but also in the case of oscillatory convergence. In the latter case, positive and negative welfare effects appear in turn, over time, during the transition phase. Therefore, we can clarify which generations gain or lose from the introduction of or a change in the PAYG pension system.

Concretely, we apply the analytical framework to the cases of dynamic efficiency and dynamic inefficiency, considering, respectively, situations where the steady-state equilibrium is monotonically and oscillatory convergence. We show that, along the transition path, a PAYG pension can be Pareto-improving even when it is dynamically efficient with monotonic convergence. We also show that the pension can reduce welfare in transition when the economy is dynamically inefficient with oscillatory convergence.

Chapter 3

In this chapter, we study the policy effect of a fully funded pension system on economic growth in an OLG model that considers two types of education for human capital accumulation, intergenerational education and self-education, in the same framework.

So far, literatures have considered only one type of human capital accumulation, accumulation of children's human capital or that of parents' human capital, in their individuals' behavior. However, as a matter of fact, people face a trade-off between these two types of human capital accumulation and thus between at least two kinds of education: intergenerational education and self-education. The former is that parents with altruism invest for their children's education and obtain utility from children's human capital or wage income in the future. The latter occurs when people prepare for their old age by investing in themselves in order to earn more in old age. Due to the worries on the future, an increasing number of people, especially in developed countries, choose to improve their skills or human capital level so they can find a good job even when becoming old. They may choose to apply a further education after university or to receive a professional training during their young age.

This chapter therefore formulates the behaviors of individuals in a small open economy model in which there exists this kind of trade-off between self-education and intergenerational education. Our main research interest is how the negative effect of individuals' self-education on economic growth can be mitigated, which has not been

discussed in previous studies; which policy can eliminate such a negative effect. We also investigate the possibility that a fully funded pension system could reduce the negative effects and bring about welfare improvement.

We first consider how individuals' self-education can contribute to raising earning power. In the previous studies, any type of human capital accumulation necessarily promotes economic growth. However, we consider the possibility that self-education or human capital accumulation of individuals has the opposite effect on economic growth. This reflects the fact that education of older individuals neither plays a role in accumulating the human capital of the next generation nor affects the human capital accumulation inherited by their descendants. If individuals invest in their children's education rather than in their own education, the economy would achieve faster growth. Therefore, in order to remove this kind of negative effect, the government must lower individuals' incentive for self-education and encourage them to educate their children.

A fully funded pension, in this chapter, is introduced as a method to achieve this goal. In our setting, a fully funded pension system is no longer neutral. Furthermore, there exists a unique optimal scale of fully funded pension that maximizes the economic growth rate. The fully funded pension guarantees a higher income in the retirement period, which discourages individuals from investing in their own self-education and instead encourages them to invest more in intergenerational education. As a result, economic growth is improved. We also find that in a small open economy, when the interest rate is increased exogenously, the government should reduce the amount of fully funded pension in order to promote economic growth.

Chapter 4

In this chapter, we investigate the effects of a coordinated capital tax reform across countries in an OLG economy.

Following the discussion of Oates (1972), Zodrow and Mieszkowski (1986) and Wilson (1986) started a formal analysis to (physical) tax competition. According to their results, a tax on mobile capital decreases the level of public goods. Consequently, this, known as a fiscal externality, causes an inefficiency of resource allocation. In general setting of static framework, it is believed that a coordinated increase in capital tax rate alleviates this kind of externality and improves social welfare. Lots of researches made efforts to challenge this notion and the most representative ones are from Leviathan models where the objective of every jurisdiction is to maximize its own tax revenues (Brennan and Buchanan, 1980).

Contrast to these static analyses, Batina (2009, 2012) provided a possibility for the under-provision of public goods from the dynamical perspective. Batina (2009)

extended the static horizontal capital tax competition model to an OLG economy and studied the effects of a coordinated reform that capital tax rates across all countries are increased which is aimed to alleviate the fiscal externality. It showed that this coordinated tax reform brings an ambiguous effect on welfare and turns not necessarily to be a Pareto improvement. By applying Batina (2009), Batina (2012) comprised a PAYG social security funded by the taxation on wage income and a public good funded by the taxation on physical capital.

However, Batina (2009, 2012) only considered the accumulation of physical capital. He focused on only a redistribution of income but not an accumulation of human capital. Recently, economic growth is driven by human capital or education in the real world. For this reason, governments control the scale of education to promote a higher economic growth or social welfare as well.

Therefore, we discuss a public education policy which is determined by an international tax competition and how its policy effects will be affected by coordinated tax reforms in an open economy. We show that in an open economy where governments tax physical capital to provide public education instead of public goods, a coordinated tax reform is no longer necessarily Pareto-improving. In particular, when the elasticity of savings to wage income is small and s_r is great enough, a lower capital tax rate will call for a higher level of human capital accumulation. Therefore, since human capital plays a role that is as important as physical capital in promoting economic growth, and when the government of each country tries to attract physical capital through a tax competition or apply to coordinately make a tax reform, it should take the policy effects of human capital as well as the physical capital into consideration.

Besides, we discuss in general terms the tax competition issue in a dynamical model. In the Zodrow–Mieszkowski model, a tax competition brings a fiscal externality. Local governments set a relatively low capital tax rate to attract physical capital, which leads the supply of public goods to be too low and thus coordination is considered to be Pareto-improving. In this static framework, an autarkic economy and an open economy share the same first-best rule: the marginal rate of transformation between private and public goods is one, $U_p/U_c=1$. In the open economy, when tax competition occurs, the marginal rate of transformation between private and public goods becomes greater than one ($U_p/U_c > 1$), implying there is a distortion from the first-best rule that public goods are underprovisioned. Therefore, a coordinated tax reform is considered to be Pareto-improving.

However, in an OLG economy, the above findings cannot be acknowledged. One feature of the OLG model is that because individuals live in the short run while social planners are concerned about the long run, the fundamental theorems of welfare

economics no longer hold. Only when the interest rate is equal to the population growth rate ($n = r$) does the economy evolve along the golden rule path. Otherwise, it is possible to accumulate too much (little) physical capital (Batina, 2009). We show that when tax competition occurs in an OLG economy, the distortions double: there are both the fiscal externality and the distortion seen in the classical OLG model. Under an OLG framework, even though the local governments coordinate, the coordination alleviates the fiscal externality brought about by tax competition, but cannot eliminate the one seen in the classical OLG model.

Besides the provision of public goods, whether a coordinated tax increase is Pareto-improving or not is independent of the situation where the economy is under dynamic efficiency. Coordination is no longer necessarily seen to be an effective behavior.

Conclusions

As representatives of intergenerational conflicts, pensions and education problems have been and should still be attached importance. In future studies, on the one hand, we should consider the reforms of education systems and public pension systems from more diverse aspects. On the other hand, we should also address other issues that reflect the conflicts between different generations, such as fertility choices, bequests, other fiscal transfers between the young and the old, and so on. Furthermore, we could apply the mathematical framework that we improved. In this manner, we would be able to shed light upon other generational conflicts by determining not only the long-run effects but also the short- and medium-run effects and the welfare gains and losses along the transition path.