Tohru Naito (Ed.) : *Sustainable Growth and Development in a Regional Economy, New Frontiers in Regional Science : Asian Perspectives*, Vol. 13, Springer, 2016, 275 p.

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This book is edited by Tohru Naito, and contains 16 papers by the editor himself and other 6 researchers. Relatively basic models are in Part I, and the extended models are in Part II. Each chapter of Part I has the counterpart of its extended models in Part II. For instance, Ch. 2 by Naito considers the model of trade and agglomeration by Ottaviano et al (2002) and Chs. 9 and 14 are the extensions. Ch. 3 considers dual economy of Harris and Todaro, which consists of urban and rural economy. This chapter as well as Ch. 2 extends the model to Chs. 9 and 14. Another important topic of this book is environmental problem, which is considered in Ch. 6, and is extended in the Ch. 13. Chapters are organized interestingly.

Next, let us look at each chapter deeply. Ch. 2 (by Naito) surveys the model of Ottaviano et al (2002), where variety of goods are assumed and the utility function is quasi-linear. There are two regions and the workers of the manufactural sector of each region can move across the border. In the long-run equilibrium, whether the workers concentrate on one region or disperse depends on the magnitude of the transportation cost of the products. If it is small, the workers will concentrate on one region.

Ch. 3 (Naito) shows the Harris Todaro model, which considers the dual economy with agricultural and manufactural sectors. Because the wage rate is high in the urban area where manufacturing sector exists, many people tries to move to there from the rural area, and consequently, there emerges unemployment. As a result, the population movement stops when the expected wage rate of the urban region equals the rural agricultural wage rate. At the long-run equilibrium, by the comparative statics, the author derived the Todaro Paradox which states that in order to decrease the unemployment of the urban sector, to subsidize the rural sector is more effective.

As an extended chapter from Chs. 2 and 3, we have Ch. 9 (Naito), which discusses the mixed economy of private and public firms in the framework of Harris Todaro and Ottaviano et al. Naito has written many papers on the mixed oligopoly and dual economy. This chapter extends his previous models by introducing the model of Ottaviano et al. The public firm aims to maximize the convex combination of the social welfare and its own profit. The privatization is defined to put more weight on the private profit from the social welfare. Theorem 9.2 states that the unemployment will decrease with privatization. This theorem seems contrary to our instinct. Giving the economic explanation of the Theorem 9.2 would be helpful to understand.

Ch. 4 (Omori) gives a survey of the fundamental dynamic models, such as Solow's descriptive growth model, Ramsey's Normative dynamics and Diamond's OLG model. In the following Ch. 5, endogenous growth model is shown as an extension of the OLG model of Ch. 4.

Ch. 5 (Ikazaki) examines the human capital investment which improves the labor productivity of the next period. The government taxes the wage income of the worker at period t , and invest the revenue into the education for the worker of the next period, $t+1$. The objective function of the government is the sum of the utilities of the generation t and that of $t+1$, ignoring unborn future generations. The optimal tax rate is as follows : When the capital is not accumulated enough, the tax rate is zero and physical capital should be

accumulated at the maximum speed. However, when the capital is accumulated enough, the tax should be positive, that is, the human capital should be accumulated, and the positive growth rate at the steady state path can be achieved, where the population growth rate is zero. This model is simple and has many possibilities of extensions to many directions.

Ch. 11 (Ikazaki) is an extension of the basic endogenous growth model of Ch. 5. This chapter examines function of interest group who donates money to the government officials in order to lessen the tax. Then as the result, there exists the case where the tax rate becomes zero due to the positive donation, and where there is no growth. This means the interest group gives damages on the growth of the economy.

Next let us move to Ch. 6 (Ouchida) which considers environment pollution. The base of this chapter is Petrakis and Xepapadeas (2003). This is the three stage game, where at the first stage the government determines the tax rate on the emission from the firm. At the second stage, the firm determines the abatement of the emission. At the third stage the firm determines the level s of the output. This model is called competition model. The next model is called Lesse-Faire model, where the firm does not abate emissions, and the government does not levy tax on the emission. And the final model is that the timing of the game is slightly modified from the first one. The author compare the outcome of the three models and derived the theorems. It seems to the reviewer that, in order to derive the simple and clear result, author assumes too strong sufficient condition is assumed. For instance, $d=1$ in Theorem 6.5~6.11.

Ch. 13 (Ouchida) extends Ch. 6 by introducing duopoly. The author compares the Nash outcome and the Cartel's, where both firms jointly maximize the sum of the profits of them. Evidently, the profit of Cartel is necessarily greater than the Nash one. But, it is not determined that which output is greater. Very interestingly, however, this paper derived that whether the Cartel's output is greater than that of Nash depends on whether its abatement is greater than that of the Nash's. It would be very helpful if the intuitive explanation of the mechanism was given.

For want of space, the reviewer cannot comment on other chapters. This book is very interesting and it contains many clues for the extensions to many directions.