論文内容の要旨

論文題目

A Structural Analysis of the Economic Fluctuations in the Japanese Economy

日本の経済変動の構造分析

氏名

稲葉　大

In this thesis, we analyze the economic fluctuations of the Japanese economy. In the policy and academic debate over the persistent recession in Japan during the 1990s, different causes of the recession has been proposed: for example, insufficient fiscal stimulation, financial frictions caused by the severe nonperforming loan problem, deflation caused by a contractionary monetary policy, and productivity declines caused by structural problems. In chapter 2, we investigate the determinants of the economic fluctuations of the 1980s and 1990s in Japan by business cycle accounting (hereafter BCA) proposed developed by Chari, Kehoe, and McGrattan (2002a, 2004, 2007a) (hereafter CKM). In chapter 3, we consider the robustness and assess the empirical usefulness of BCA. Finally, chapter 4 shows a hypothesis and empirical evidence of cause the productivity decline in early 1990s in Japan.

In chapter 2, we apply BCA to the Japanese economy. Recently, a

"dual " method for the standard approach was proposed and applied in an analysis of the Great Depression by Mulligan (2002) and CKM (2002a, 2004, 2007). In the standard approach, the researchers model market distortions and shocks in a neoclassical growth model, calibrate parameters, and simulate the equilibrium outcome by numerical calculations. Then, the performance of a dynamic equilibrium model is judged by the closeness of the simulated outcome to the actual data. In the dual method, by contrast, it is assumed that the economy is described as a standard neoclassical growth model with time-varying wedges: productivity, labor taxes, investment taxes, and government consumption. These wedges, called efficiency, labor, investment, and government wedges, are measured so that the outcome of the model is exactly equal to the actual data. Therefore, in this dual approach the distortions are measured so that the model replicates the data exactly. The dual approach, which is named "business cycle accounting (BCA) " by CKM, has several useful features. First, the calculations are quite easy to make, since the wedges are directly calculated from the equilibrium conditions, which necessitate data for only one or two consecutive years and few assumptions on the future equilibrium path (see also the propositions in Mulligan [2002]). Second, BCA is a useful method for guiding researchers in developing relevant models. This is because, as CKM (2004, 2007a) show, a large class of quantitative business cycle models is equivalent to a prototype growth model with wedges. Since the BCA procedure shows which wedges are most crucial in actual business fluctuations, researchers can judge their business cycle models by whether they can reproduce relevant wedges. BCA seems to provide particularly useful insight into the recent recession in Japan. The result we find in chapter 2 is as follows. The effect of the investment wedge are not a significant cause of the persistent recession during the 1990s. The output due to the effi-

ciency wedge roughly replicates actual output, while the discrepancy widened during the 1990s. The labor wedge had a large depressing effect on output during 1989–2005. The efficiency wedge explains the recent economic recovery.

In chapter 3, we examine the equivalence results in business cycle accounting by focusing on the VAR(1) specification of wedges. As a justification of the prototype model in BCA, CKM claim that the prototype model achieves the same allocation of a large class of frictional models: equivalence results. Equivalence results suggest that the prototype model is equivalent to a detailed model if and only if the first order conditions of the prototype model are satisfied given any allocation of consumption, investment, labor, and output generated by the detailed model through the adjustment of wedges. CKM show equivalence results under general conditions about process of wedges. However, in practice, they impose that wedges evolve according to the first order vector autoregressive, VAR(1), process. It is not clear whether VAR(1) specification of wedges is consistent with conditions in terms of equivalence results. Many papers that apply BCA also employ VAR(1) specification of wedges. Therefore, it is important to investigate the class of models covered by the prototype model with the VAR(1) specification of wedges. In this chapter, we characterize the class of frictional models covered by the prototype model with the conventional VAR(1) specification of wedges. We find that the prototype model covers a detailed model if and only if wedges have sufficient information about the endogenous and exogenous states of the detailed model. Intuitively, the number of independent wedges should be larger than that of endogenous and exogenous state variables in the detailed model. We show that some examples of the equivalence in CKM are not covered by the prototype model with the VAR(1) specification of wedges. Therefore, the

condition for equivalence results is highly restrictive if we employ the VAR(1) specification of wedges. In addition, we extend our analysis to an alternative specification which has the VAR(1) specification as a special case and find that the class of models covered by the prototype model is not so large even in such case. We also apply BCA to an artificial medium-scale dynamic stochastic general equilibrium model, which is not covered by the prototype model, in order to assess the empirical usefulness of BCA. We provide an example that measured wedges capture the properties of the true wedges almost correctly even in such an economy. Therefore, our result tells us that even if the prototype model is not equivalent to a detailed model, BCA might work well since the prototype model is as a good approximation of the detailed model.

In chapter 4, we investigate causes of the productivity decline in early 1990s in Japan as we find in chapter 2. A hypothesis proposed by Kobayashi (2004) is that the mechanism of debt disorganization caused the protracted stagnation in Japan. An intuitive explanation of debt disorganization is as follows: once bad debts are rolled over by banks, the commitment by the debtor becomes untrustworthy. Therefore, the rollover of bad loans generates distrust among firms and disrupts the chain of production. If this is the case, a trend of increasing bank loans can coexist with slow output growth and productivity decline. This mechanism seems to be not consistent to the result of business cycle accounting that financial frictions measured as investment wedge do not play a major role in the business cycles. However, the simple model in chapter 4 can explain the productivity decline caused by financial friction. CKM also show a detailed economy with input-financing frictions is equivalent to a prototype economy with efficiency wedge. In this sense, financial frictions can be shown as efficiency wedge. In this chapter, we conduct an em-

pirical analysis to investigate whether or not debt disorganization occurred and caused the productivity decline in the early 1990s in Japan. If the mechanism of debt disorganization affects the economy, the productivity is decreasing in the number of firms in a production network of a sector, because the large number of firms in a production network tends to rise the distrust between firms. We use the Herfindahl index of complexity as a proxy of the number of firms in a production network of a sector. The index is introduced by Blanchard and Kremer (1997) to examine disorganization in the former Soviet countries. As Blanchard and Kremer do, we assume that the complexity of a production chain tends to become higher as the input structure of the sector grows more complex. Our results of regressions of output on the index indicate that disorganization might have occurred, and it may have been particularly severe in industries that are heavily indebted.

As a footnote to the above, chapter 2 and 4 are based on collaborative studies with Keiichiro Kobayashi. Chapter 3 is based on a collaborative study with Kengo Nutahara.