Econometric Analysis of Quantitative Easing in Japan

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（日本における量的金融緩和政策の計量分析）

区　　分　：甲

論　文　内　容　の　要　旨

We attempt to assess the macro-level effects of quantitative easing in Japan by using TVP-VAR model. Four transmission channels, including interest spreads, stock price, lending and exchange rate, through which the monetary policy exerts influence on the real economy, are examined. This dissertation contributes to investigate the effects of monetary policy under four governors from 1998, and detect the efficiency of four transmission channels.

In the first chapter, the economic condition of Japan is summarized to build the background of study. By investigating GDP growth rate and its components, we find that GDP growth and its main components' growth rates fluctuated around zero, without any obvious and lasting uptrend from 1995. Meanwhile, several shocks, such as significant change of monetary policy in first quarter of 2001 and financial crisis in 2008, happened to cause short-term and negative impacts on GDP and its components. As we know, Bank of Japan (BOJ) started to implement quantitative easing around 2001. The purpose of the paper is to figure out whether these monetary polices are efficient to stimulate the real economy of Japan or offset the negative impacts on the economy from non-monetary field. How did the transmission channels, through which monetary policy affects the real economy, work? How was the effect of monetary policy under every governor of BOJ from 1998? We also attempt to answer these questions in this dissertation.

Chapter 2 surveys the related literatures on Quantitative Easing (QE). We find that quantitative easing, including asset purchases, zero interest rate and commitment to keep interest rate zero until a target (ex. inflation) meets, would influence asset prices, exchange rate and bank lending in the financial market, subsequently agents in the market respond by changing investment portfolio and increasing spending, finally GDP and inflation are affected. This is a compact transmission mechanism from monetary policy to financial market, at last to the real economy. With respect to the methodology, DSGE models and VAR models are the most popular methods of the study on macro-effects of monetary policy. However, QE under zero interest rate is different from the normal monetary policy. When we use the theoretical DSGE models, the final results or conclusions are susceptible to the assumptions and specifications of each dynamic relation. Both of difference from normal policy and susceptibility make it to be a challenge to build new DSGE models to analyze quantitative easing under zero interest rate. TVP-VAR models would not only allow us to evade this challenge, but also provide us a feasible

way to deal with possible structural breaks of Japan's economy caused by monetary policy or non-monetary field. Thus, we adopt TVP-VAR models, which are data-driven and allow the parameters to be time-varying.

In the third chapter, the main monetary policy by BOJ is investigated by grouping into four periods corresponding with four governors of BOJ. By depicting the main monetary policy accompanying with the changes of balance sheet of BOJ, we find that three major policy adjustments. One is in March of 2001, when BOJ changed policy target from call rate to Current Account Balance (CAB) and increase purchases of Japanese Government Bonds (JGBs). Second, BOJ reduced call rate to be near zero again to respond the financial crisis in December 2008. Third, a comprehensive monetary easing policy, so called the second round of QE, was announced in October 2010. Moreover, purchases of JGBs are the most important operation tool by BOJ, since the main source of changes in both assets side and liabilities side of balance sheet is from JGBs.

Chapter 4 analyzes three TVP-VAR models with macro-economic variables and policy variables. The results show that monetary base would be the best policy variable, based on the used sample. Because in the monetary base model, parameters are stable or changes in betas are small accompanying with small variances in sigmas and almost flat alphas; macro-economic variables (industrial production and inflation) responded to the shocks from monetary base obviously and diversely, relative to the performances in the other two models. Moreover, possible structural breaks, detected from dynamic movements of parameter in three models, are corresponding with the three major policy adjustments of Chapter 3.

In Chapter 5, two groups of models are estimated. One group contains four models with macro-economic variables, financial variables and monetary base. The financial variables, including interest spreads, stock price, lending and exchange rate, represent four transmission channels. The other group consists of another four models with same variables, except spending. We replace inflation in the first group by spending, in the second group. Finally, we compare the results from nine estimated results to make conclusions. We find that the channel of interest spreads exists in the whole sample period, that is, monetary policy by BOJ would stimulate the real economy positively through the interest spreads channel from 1991 Q2 to 2004 Q4. The channel of stock price did work in this period, but weak. There is not much enough evidence to support the channel of lending. The monetary policy under Haruhiko Kuroda held positive influence on macro-economy mainly through the exchange rate. Furthermore, the channel of interest spreads played most important role for monetary policy under Toshihiko Fukui and Masaaki Shirakawa.

Chapter 6 presents the conclusions, implications and scope for further research. We find that QE could stimulate the real economy through the channel of interest spreads. Much of their findings suggest that QE of BOJ played an important role in bolstering Japan's economy by stabilizing financial market, but its transmission channel to macro-economy remained blocked or its effects on the real economy were too weak to be detected significantly.