

博士論文要旨

Analysis on the Macroeconomic Effects of Fiscal Policy and Business Cycles in Japan

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2014年3月

1 Introduction

Since the collapse of the bubble economy in the early 1990s, Japan has fallen into a period of low economic growth. Furthermore, recent financial crises and some natural disasters have also exerted a serious negative influence on the Japanese economy. In the face of this economic downturn, the fiscal and monetary authorities in Japan have implemented a large number of economic stimulus packages. At the same time, however, concerns about the effectiveness of these economic policies are increasing. Although many researchers have tried to analyze this from an academic perspective, there has not been a great deal of consensus on this topic.¹ Facing such a situation, the principal goal of this dissertation is to reevaluate and clarify the macroeconomic effects of fiscal and monetary policy in Japan (in the framework of a time series analysis), by using the vector autoregression (VAR) model. Moreover, beyond the analysis of

¹Shioji (2000) and Miyao (2000) are seen as representative of research on monetary policy in Japan, while Watanabe et al. (2011) are referred to as representative of its fiscal policy.

the effects of the macroeconomic policy, we also explore the sources of business fluctuations in the recent Japanese economy. Related to the Lehman shock, which created a huge negative impact in Japan, we focus on the role of external shocks, such as risk premiums and foreign demands. In this dissertation, we empirically investigate the effects of fiscal and monetary policy in the former part (Chapters 2, 3, and 4) and the source of business cycles in the latter part (Chapter 5).

The contributions of our analysis are summarized as follows. First, we identify anticipated fiscal policy shocks, that is, fiscal news shocks, as well as unanticipated fiscal policy shocks. The foreseeability of fiscal policy has so far been disregarded in Japan's macroeconomic analysis. However, as Ramey (2011) points out, there is a possibility that the implementation of fiscal policy is subject to two lags (i.e., decision and implementation lags); in this light, we must estimate the actual effects of fiscal policy.

Second, we adopt new and advanced estimation techniques in our analysis. Throughout this dissertation, we identify structural shocks by sign restrictions originally proposed by Uhlig (2005). In addition, we achieve model-based identification that cannot be done by a recursive restriction using Cholesky decomposition, in terms of deriving sign restrictions from the Dynamic Stochastic General Equilibrium (DSGE) model. In addition, the Markov Switching model and the time-varying parameters VAR model are employed in Chapters 3 and 4. The Markov Chain Monte Carlo (MCMC) method is also used in these estimations.

Third, in Chapter 4, we present a new identification method for unconventional monetary policies conducted under the zero lower bound (ZLB) of the nominal interest rate.

Finally, this dissertation conducts analysis of current topics by using new data. For instance, Chapter 2 investigates the quantitative effects of Abenomics, which is an economic stimulus package implemented by Prime Minister Shinzo Abe, on macroeconomic variables by using historical decomposition. Chapter 5 clarifies exactly which structural shock can explain the

rapid fall of output in light of the Lehman shock and the Great East Japan Earthquake.

2 Overview: Chapter 2

Chapter 2 investigates the effects of anticipated fiscal policy shock in Japan. Since Ramey (2011) indicated the importance of fiscal policy predictability (or so-called fiscal foresight), a large number of studies have analyzed the effects of anticipated fiscal policy for the U.S. economy (e.g., Mountford and Uhlig 2009; Mertens and Ravn 2010; Tenhofen and Wolff 2010). As stated by Ramey (2011), we cannot estimate the true effects of fiscal policy if we fail to capture the timing of fiscal policy shocks. On the other hand, in Japan, there have been few analyses that take fiscal foresight into account. The principal purpose throughout this dissertation, especially in Chapters 2, 3 and 4, is to reevaluate the effects of fiscal policy of the Japanese fiscal policy based on the ideas of Ramey (2011).

In Chapter 2, we identify anticipated fiscal policy shocks by combining the approach presented in Fisher and Peters (2010) and model-based robust sign restrictions. Fisher and Peters (2010) identify anticipated government military spending shock by regarding innovations occurring in excess stock returns in the military contractors as a proxy of fiscal news shock. We apply their identification scheme to the relationship between government spending and the construction industry in Japan. However, a problem exists regarding the direct application of Fisher and Peters (2010) method to the Japanese economy. To be specific, not all variations in stock returns of the construction industry are driven by the fiscal news shock, because construction firms deal not only with the public sector but also the private sector. To cope with this problem, we introduce the sign restrictions developed by Uhlig (2005) to identify anticipated fiscal policy shock. In particular, the robust sign restrictions, in which restrictions are derived from the dynamic stochastic general equilibrium (DSGE) model, are employed as in Dedola and Neri

(2007) and Pappa (2009). In Chapter 2, we build a New Keynesian (NK) model that is a variant of Galí et al. (2007), and then derive the sign restrictions characterizing anticipated fiscal policy shock from the theoretical model. In addition, Chapter 2 performs the historical decomposition (HD) in the period of Abenomics to evaluate the impact of the recent large fiscal news shock on macroeconomic dynamics.

The estimated results in Chapter 2 reveal that anticipated and unanticipated fiscal policy shocks have a positive effect on consumption, but a negative effect on investment. It also turns out that a large part of forecast error variances in private consumption are explained by anticipated fiscal policy shocks. The results of the HD focus on Abenomics indicate that the fiscal news shock occurred in 2013Q3 and 2013Q4, and that they positively contributed to private consumption.

3 Overview: Chapter 3

Chapter 3 aims to ascertain whether the macroeconomic effects of fiscal policy are affected by the existence of rule-of-thumb (ROT) households. This is motivated by the theoretical findings shown by Galí et al. (2007), in which they incorporate the households faced with liquidity constraints into the NK model and theoretically demonstrate the positive response of consumption to government spending shock observed in empirical works.

To achieve our purpose, Chapter 3 adopts the following process. First, we extend the consumption function presented by Campbell and Mankiw (1989) to the Markov Switching (MS) model. Based on the MS-consumption function, the sample period is divided into high and low ROT household states depending on the share of ROT households. Then, we estimate the VAR model for each sample period, and calculate the impulse response of consumption to fiscal policy shocks. Chapter 3 also uses sign restrictions and identifies unanticipated and

anticipated fiscal policy shock.

The results of Chapter 3 are summarized as follows. The high ROT household states are observed in the periods following large negative economic shocks, such as the oil shock and the economic bubble burst in the early 1990s. The estimated parameter values in MS-consumption function indicate that the average growth rate of consumption is low, but that variance is elevated in the high ROT household period. The main finding in Chapter 3 is that consumption in a high ROT state responds more significantly to unanticipated fiscal policy shocks compared to consumption in a low ROT state. This finding empirically supports the theoretical results of Galí et al. (2007).

4 Overview: Chapter 4

In Chapter 4, we estimate the TVP-VAR model with stochastic volatility, developed by Primiceri (2005), and analyze time-varying effects for fiscal and monetary policy in Japan. One of the contributions of Chapter 4 is to present a new identification strategy for unconventional monetary policy, such as the zero interest rate policy (ZIRP) or quantitative easing (QE). We characterize monetary policy shock under the ZLB of the nominal interest rate by combining zero restrictions for this equation adopted by Nakajima (2011), with sign restrictions for unconventional monetary policy as discussed in Franta (2011). More precisely, we regard a shock that lowers the short-term interest rate and increases the monetary base as a policy shock, and we further assume that the short-term interest rate cannot respond to structural shocks under the ZLB period.

Moreover, the principal aim of Chapter 4 is to assess whether the effects of fiscal policy increase during the ZLB period, as theoretically shown in Christiano et al. (2011) and Eggertsson (2011). To accomplish this, we calculate the time-varying fiscal multiplier based on the

estimated impulse response functions (IRFs).

The findings of Chapter 4 are as follows. In the ZLB period, the estimated volatility of the short-term interest rate is small, while that of the monetary base is large. In addition, both monetary and fiscal policies have positive effects on output throughout the sample period. Finally, we cannot obtain the evidence that fiscal policy effects increase during the period of the ZLB.

5 Overview: Chapter 5

Unlike the above chapters, Chapter 5 focuses on the effects of external shocks on the Japanese economy, such as risk premium shocks and foreign demand shocks. More precisely, we investigate the sources of Japanese business fluctuations since the 1990s, taking into account both external shocks and domestic supply and demand shock. The recent global financial crisis, which caused a large reduction in output, reconfirms the fact that the Japanese economy is heavily influenced by economic situations in foreign countries.

The methodology adopted in Chapter 5 is similar to Chapter 2, that is, we use the model-based robust sign restrictions. In this Chapter, we construct a small open economy NK model that is a variant of the one presented by Leeper et al. (2011) to determine the features of the structural shocks. Moreover, we perform the FEVD and HD as well as IRF analysis in order to evaluate the effects of external shocks not only qualitatively but also quantitatively. In particular, we clarify which shocks contribute to the rapid fall of output in the Lehman shock and the Great East Japan Earthquake.

The results obtained in Chapter 5 show that approximately 30% to 50% of the forecast error variances in output can be explained by external shocks. Furthermore, we demonstrate that supply shock is the main influencing factor in Japanese business fluctuations throughout

the sample period and that the roles of external shocks have been growing in the post-Lehman shock period, including the effect of the Great East Japan Earthquake.