

博士学位請求論文要旨

Essays on Fiscal-Monetary Interactions and Unconventional Monetary Policies

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1 Motivation

Since the onset of the global financial crisis in 2008, the fiscal and monetary authorities in developed countries have experienced dramatic changes. There are two observations on recent developments in fiscal and monetary policies that motivate studies in this dissertation. First, the debt-to-GDP ratio has been growing in most developed countries. For example, in the United States, the public debt-to-GDP ratio has sharply increased to a historically high level. Meanwhile, as of 2022, the U.S. government has not announced a clear plan for a fiscal adjustment that would stabilize the debt-to-GDP ratio. While inflation rates in the most developed countries have been relatively low and steady, if these fiscal situations remain unchanged, one of consequences is that public confidence in the fiscal authority's willingness to stabilize the debt-to-GDP ratio is lost, and the central bank is forced to adjust its policy to maintain the sustainability of public debt, which could have significant effects on inflation and economic activities.

Second, in recent years, major central banks have faced low levels of economic activity and low inflation rates. To stimulate the economy, they have set their policy interest rates to

zero. After the short-term nominal interest rate reached its zero lower bound (ZLB), some unconventional monetary policy measures have been introduced in an attempt to influence the current state of the economy. The Federal Reserve and the Bank of Japan have relied on forward guidance by announcing that they intend to keep short-term nominal interest rate low in the future. In addition to this, central banks have engaged in massive purchases of long-term government bonds (e.g., the Federal Reserve's Large Scale Asset Purchase Programs and the Bank of Japan's Quantitative and Qualitative Monetary Easing (QQE)). These operations have expanded the size of central banks' balance sheets and lengthened the duration of assets they hold. This has raised concern that central banks would incur losses on their balance sheets anytime the policy rate increases. Some have pointed out that these losses could require a recapitalization from the fiscal authority, especially in countries like Japan, where the central bank has engaged in the large-scale purchases of long-term government bonds. If the fiscal authority is unable or unwilling to provide sufficient financial support for the central bank due to political reasons, possible actions by the central bank would be constrained by its financial condition.

In standard models for monetary policy analysis, however, the above two issues do not arise because it is implicitly assumed that (1) the fiscal authority commits to covering possible losses on the central bank's balance sheet, and (2) it also commits to adjusting the present discounted value of primary surpluses to ensure solvency of the consolidated government.

2 Objective

In this dissertation, we examine the effects that unconventional monetary policy measures, especially purchases of long-term bonds, have on the economy departing from the two standard assumptions. The issue of unconventional monetary policy measures has already

been addressed by the seminal work of Eggertsson and Woodford (2003). They study monetary policy at the ZLB by using a New Keynesian model in which the two standard assumptions hold. However, as discussed above, it is worth reconsidering how purchases of long-term bonds affect the economy in a setting where interactions between the fiscal and monetary policies have equilibrium implications. In each chapter of this dissertation, we investigate channels through which purchases of long-term bonds stimulate the economy at the ZLB and/or possibilities that the operation would be destabilizing.

3 Structure

Chapter 1 provides an overview of this dissertation and reviews literature related to our study. In chapter 2, we briefly review the fiscal theory of the price level (FTPL). The remainder of this dissertation is structured as follows.

Chapter 3: Central Bank's Balance-Sheet Policy in a Non-Ricardian Regime: An Expansionary Effect without a Signal about Future Interest Rates

This chapter examines how purchases of long-term bonds influence the economy at the ZLB by using the framework of the FTPL. One of key assumptions in this chapter is that the fiscal authority does not make fiscal adjustments needed to stabilize public debt. As discussed above, in recent years, a number of central banks have engaged in massive purchases of long-term bonds once their policy rate is stuck at zero. The standard view is that such a policy influences economic activities at the ZLB by sending the public a signal about the future path of nominal interest rates. We demonstrate that, with an appropriate institutional arrangement between the fiscal authority and the central bank in place, purchases of long-term bonds have

expansionary effect without the signaling channel. Another key assumption to show this result is that the fiscal authority commits to covering possible future losses on the central bank's balance sheet. In this setup, the consolidated government's budget must incur losses at a time of liftoff from the ZLB, which results in an increase in inflation via the mechanism highlighted by the FTPL. This prospect leads the private sector to expect higher future inflation even when the current nominal interest rate is stuck at the ZLB, stimulating inflation and output today.

This result has an important implication for monetary policy at the ZLB. When the economy falls into the ZLB again in a next recession, the central banks can stimulate the economy without struggling to communicate their future policy intentions to the public. The management of expectations at the ZLB has presented a serious challenge for central banks. In light of the current fiscal situations in developed countries, purchases of long-term bonds can be an alternative tool for central banks to influence the macroeconomy during a next deep recession.

Chapter 4: A Fiscal Theory of Central Bank Solvency: Perils of the Quantitative and Qualitative Monetary Easing

This chapter develops a theory to consider solvency of the whole government sector and that of the central bank in a unified way. Specifically, we analyze a model with two key assumptions: (1) the fiscal authority does not make fiscal adjustments needed to stabilize public debt, and (2) the central bank has responsibility for maintaining its financial stability. In this model, possible actions by the central bank at a time of liftoff from the ZLB can be subject to not only a solvency condition of the whole government but also its own solvency condition. The model is used to ask: how does a lack of public confidence in fiscal sustainability constrain the Bank of Japan's strategy to exit from the QQE?

In a baseline analysis, we demonstrate the following two results. First, in the case of a passive fiscal policy in the sense of Leeper (1991), the action of the central bank is not constrained by its financial condition. This is because the central bank can maintain its solvency solely by allowing the price level to increase to an arbitrarily high level to reduce the real value of its liabilities, regardless of the amount of losses on its balance sheet. Second, in the case of an active fiscal policy in the sense of Leeper (1991), the central bank that holds long-term bonds above a certain threshold cannot freely raise the future path of nominal interest rates at a time of liftoff from the ZLB.

Next, we extend the baseline model to explore richer implications of our study for policy, assuming an active fiscal policy. To do this, we specify a rule according to which the central bank controls the short-term nominal interest rate after liftoff from the ZLB. First, we study the case of a passive monetary policy in the sense of Leeper (1991). We show that, under certain conditions, the central bank can achieve its inflation target after liftoff at least in the long run. In this case, however, inflation right after liftoff must undershoot the central bank's target inflation. Second, we study the case of an active monetary policy in the sense of Leeper (1991). We then show that, under certain conditions, the central bank fails to prevent the economy from converging to the deflationary steady state after liftoff. Furthermore, the model is extended to incorporate a possibility that the fiscal authority partially defaults on outstanding government bonds at a time of liftoff from the ZLB. The result is that the central bank that holds long-term bonds above a certain threshold cannot achieve its inflation target by following the Taylor principle even when it is willing to allow the fiscal authority to default on its bonds.

Chapter 5: Fragmented Fiscal Policymaking in a New Keynesian Model

This chapter develops a dynamic general equilibrium model augmented with a particular type of political economic aspect of fiscal policymaking. In most models used to study fiscal-monetary interactions, fiscal policy is decided by a single policymaker in a centralized manner (e.g., Leeper, 1991; Sims, 1994; Woodford, 1995, 2001; Cochrane, 2001). This assumption, however, is not necessarily realistic. In reality, several interest groups are involved in a process of fiscal policymaking, and therefore it would be a strong assumption that all of them can coordinate to achieve certain conduct of fiscal policy. In the politico-economic literature, a common pool problem that arises when fiscal policymaking is influenced by fragmented interest groups is regarded as one of main causes of socially excessive public spending or public debt stock (see, e.g., Weingast et al., 1981; Chari and Cole, 1993; von Hagen and Harden, 1995; and Velasco, 2000).

Thus motivated, we construct a New Keynesian model in which two fragmented interest groups influence tax policy. There are two key assumptions. First, lump-sum taxes are unavailable and the fiscal authority can only choose labor income taxes to decrease accumulated debt. Second, tax policy decisions are made in a decentralized manner. Each interest group can choose labor tax rate imposed on households in its own group. The government is weak and has to meet the requirements from the interest groups at face value.

In this model, interactions among the interest groups and the central bank through the consolidated government budget constraint have implications for equilibrium dynamics. This government structure induces a common pool problem once the interest groups expect the central bank to accommodate their free-riding behaviors. The main objective of this chapter is to study how coordination failure between interest groups distorts the optimal conduct of fiscal and monetary policy. Particular attention is paid to the roles the central bank is forced to play in a stabilization process.

Using the above model, we first examine how the economy in which the debt stock is initially above a steady-state level is stabilized over time. The results of numerical analysis are summarized as follows. First, it is socially optimal to increase the labor income tax and inflation in order to decrease government debt. A benevolent planner would choose the timing of the tax collection and inflation to maximize social welfare.

Second, in a non-cooperative game between the interest groups, a resulting response of the tax rate becomes negative. Against the inflationary pressure from accumulated debt, interest groups find it optimal to lower the tax rate. They aim to attenuate upward pressure on group-specific inflation by decreasing marginal costs. The interest groups do not fully internalize that their actions affect economy-wide inflation through their budgetary effects. This free-riding activity puts socially excessive downward pressure on marginal costs and slows down debt stabilization excessively. The former in turn puts downward pressure on current inflation, whereas the latter delays the timing of inflation. Overall, the free-riding activity of the interest groups causes a positive response of inflation excessively gradual. Then, the central bank is forced to make a response of the nominal interest rate excessively gradual. This is required to smooth the real interest rate and thus output gap given a gradual response of inflation.

Next, we introduce the possibility that the economy falls into the ZLB. As in the baseline case an initial debt stock is above a steady-state level. The difference now is that the economy temporarily falls into the ZLB due to a large negative shock to the natural interest rate. While the nominal interest rate is temporarily stuck at zero, the economy eventually converges to a steady state. We study how a negative demand shock, along with the presence of the ZLB, changes results in the baseline analysis. The main results are twofold. First, if the interest groups coordinate, then purchases of long-term bonds have an expansionary effect on the economy at the ZLB. Second, coordination failure between the interest groups weakens this expansionary effect of purchases of long-term bonds.