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Monetary-fiscal policy interactions under asset purchase programs: Some comparative evidence

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A B S T R A C T

Using a policy-oriented multivariate VECM approach and monthly data over the period of unconventional monetary policy, this paper presents the first evidence of both long-run and short-run dynamic interactions between unconventional monetary policy and fiscal policy under central banks' large-scale asset purchase programs for the United States and Japan. Empirical results show clear differences in monetary-fiscal policy interactions between the two countries. First, our findings suggest that fiscal policy acts as the leading indicator in the monetary-fiscal policy combination in the U. S., while monetary policy acts as the leading indicator in the monetary-fiscal policy combination in Japan. Second, the impact of the BOJ's government bond purchases on monetary stock is much smaller than that of the Fed's Treasury securities purchases, suggesting differences in the transmission mechanism of unconventional monetary policy in the two countries. Lastly, compared to the U. S., the monetary-fiscal policy combination in Japan has been found to have less impact on macroeconomic variables during the period of unconventional monetary policy. This evidence suggests that monetary policy and fiscal policy reinforce each other more in their effects on the macroeconomy in the U. S.

1. Introduction

In response to the global financial crisis and ensuing sharp global recession, unprecedented monetary and fiscal policy actions were undertaken by the central banks and governments of advanced economies.

On the monetary policy side, after the financial crisis, many central banks in advanced economies lowered their policy rates to nearly zero. In order to stimulate economic activity and stabilize financial markets further when short-term interest rates reached the zero lower bound, they turned to targeting quantity variables and expanding their balance sheets substantially through large-scale asset purchases. This approach to monetary policy has been at center stage since 2008 and has been labeled "unconventional monetary policy".

On the fiscal policy side, we have seen proactive fiscal policy during and after the global financial crisis in advanced economies. Maintaining an expansionary fiscal policy stance is regarded as important by policy makers when on the one hand, the effectiveness and impact of unconventional monetary policy is uncertain due to a lack of experience with unconventional monetary policy tools, and on the other hand, yields on government securities are near zero due to ultra-low policy interest rates (in other words, the financing costs for governments become very cheap) and inflation is lower than desired (or even in deflation).[1]

The unified and aggressive combination between unconventional monetary policy and fiscal policy under asset purchase programs is a distinctive feature of the policy response in advanced economies to the global financial crisis. The unusual monetary-fiscal policy combination has created an unfamiliar mechanism of monetary-fiscal policy interactions. Hence, bringing monetary and fiscal policy together and analyzing how the policy combination works in the low-interest-rate, low-inflation environment has become an important subject of academic inquiry.

Although there is a large body of literature that examines interactions between monetary and fiscal policies (e.g. Sargent and Wallace, 1981; Aiyagari and Gertler, 1985; Alesina and Tabellini, 1987; Leeper, 1991; Sims, 1994; Woodford, 2001; Dixit and Lambertini, 2003; Muscatelli et al., 2004; Cochrane, 2011; Cui, 2016; Bianchi and Ilut, 2017), very little attention has been given to how unconventional monetary policy interacts with fiscal policy. Moreover, empirical studies about monetary-fiscal policy interactions exist to a very limited extent (Muscatelli et al., 2004; Cevik et al., 2014; Kliem et al., 2016).

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[1] When nominal interest rates are close to their zero bound, expansionary fiscal policy may reduce real interest rates through fiscal inflation. See Leeper and Walker (2012) for a detailed illustration of fiscal inflation.

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Why might monetary-fiscal policy interactions be dependent on how monetary policy is implemented? To put it differently, why is it important to analyze monetary-fiscal policy interactions during the period of unconventional monetary policy?

As already mentioned, the zero lower bound of nominal short-term interest rates is the key factor significantly restraining the effectiveness of conventional monetary policy and the main justification for central banks to take unconventional policy actions, such as large-scale government bond purchases. In theory, such unconventional monetary policy measures would make monetary policy and fiscal policy become more closely linked than under normal circumstances, which would have an expansionary effect on the economy. For instance, central banks' purchases of longer-term government bonds would flatten the yield curve at longer maturity, which would increase government spending by relaxing fiscal constraints on the government and hence stimulate aggregate demand.[2] Central banks' large-scale longer-term government bond purchases would also reduce the level of longer-term interest rates of riskier financial assets (for example, privately issued securities) since government bond yields serve as a benchmark for asset-pricing in financial markets. This would lead to lower financing costs for the private sector and financial market risk premia, which would, as a result, stimulate private consumption, investment and employment.

However, it needs to be noted here that the above-explained expected effects stemming from the monetary-fiscal policy combination might hinge on certain factors such as, for instance, how central banks' government bond purchases have been implemented and the extent to which the additional liquidity provided by central banks' government bond purchases has been passed on to the non-financial and the private sector. If central banks purchase longer-term government bonds mainly from banks and banks choose to hold the liquidity received in exchange for the bonds at central banks as excess reserves rather than making new loans to the non-financial and the private sector, then the liquidity provided by central banks would stay idle within the banking system. It is conceivable that in this case, the expected expansionary effect of interactions between unconventional monetary policy and fiscal policy would be hindered. It is inferred that banks (the banking system) would be very crucial in determining macroeconomic outcomes of interactions between unconventional monetary policy and fiscal policy in bank-based financial systems. It has recently been suggested that financial structure (the mix of financial instruments, markets, and intermediates operating in an economy) is an important factor affecting the approach and effects of unconventional monetary policy (Cour-Thimann and Winker, 2012; Wang, 2016).[3] Hence, we believe that financial structure would be a relevant factor when we analyze interactions between unconventional monetary policy and fiscal policy.

How economic agents' expectations would be affected by long-run fiscal stress also seems to be relevant here. Although, as already pointed out, large-scale purchases of government bonds by central banks (monetary authorities) would have an expansionary impact on aggregate economic activity, there may be adverse effects as well. For example, it is likely to lead to an increase in the expected future government debt through monetary authorities' accommodation of supply of government bonds and fiscal expansion. In particular, the likelihood would increase when governments already have heavy debt burdens and are facing long-term fiscal difficulties, such as large implicit liabilities from unfunded pension and health care programs with rapidly aging populations. As the Ricardian debt neutrality proposition implies, the increase in the expected future government debt may exacerbate economic agents' uncertainty about fiscal sustainability and raise their doubts about governments' debt-repaying ability in the future, making it difficult to increase private spending. In this case, the expected effects of the expansionary monetary-fiscal policy mix would be jeopardized.

In light of these considerations, this paper examines empirically interactions between unconventional monetary policy and fiscal policy under central banks' large-scale asset purchase programs (focusing on longer-term government bond purchases) through cross-country multivariate time-series analyses, while taking financial structure and government debt sustainability into account in an attempt to get a more complete picture of the monetary-fiscal policy interactions.

In this paper, I apply VAR methodologies to a set of monthly variables for the United States and Japan. In order to model the monetary-fiscal policy interactions and estimate macroeconomic outcomes stemming from the monetary-fiscal policy combination during the period of unconventional monetary policy, a 5-variable system comprising monetary and fiscal policy variables and macroeconomic variables, and a sample covering the unconventional monetary periods of the two countries are employed (see Section 3.2 for more details).

To the best of my knowledge, this is the first empirical investigation of the interactions between unconventional monetary policy and fiscal policy, and also the first comparative study between the United States and Japan regarding the issue. My focus on the two advanced economies is motivated by several factors. First, since both the U. S. and Japan have coordinated their unconventional monetary policy and fiscal policy to stimulate economic activities, it is necessary to understand the monetary-fiscal policy interactions during the unconventional monetary periods of the two countries. Second, while the U. S. and Japan are both at the same level of economic development, it is well known that the two countries have contrasting financial structures.[4] Hence, the approach of conducting a comparison between the U. S. and Japan could not only shed some light on the impact of financial structure on monetary-fiscal policy interactions, but also provide further cross-country evidence for understanding the economic implications of different financial structures. Finally, concern about fiscal sustainability is increasing in both the U. S. and Japan, although Japan suffers more from long-run fiscal stress due to the faster pace of population aging and the resulting heavier national burden in maintaining the social security system (such as the public pension system and the public health insurance system) amid more persistently weak economic growth as well as a more serious problem of government debt (see e.g. Doi et al., 2011; Muto et al., 2016; Elmendorf and Sheiner, 2017). I consider that a comparison of the experience of the U. S. and Japan would provide us with fresh evidence on the crucial, yet under-explored, research question whether long-run fiscal stress affects the outcomes of the monetary-fiscal policy combination under asset purchase programs.

The remainder of this paper is organized as follows. Section 2 summarizes the recent movement of the coordination of unconventional monetary policy and fiscal policy in the U. S. and Japan. Section 3 examines empirically the interactions between unconventional monetary policy and fiscal policy under central banks' large-scale asset purchase programs in the two countries by conducting multivariate time-series analyses. Section 4 provides conclusions and draws implications from the analyses.

2. Recent evolution of monetary and fiscal policy coordination in the U. S. and Japan

In this section, while mainly focusing on the post-crisis era, I briefly summarize recent movements in the coordination of unconventional

[2] Recent research (e.g. Christiano et al., 2011; Woodford, 2011) suggests that the expansionary effect of government spending would be larger when monetary policy is constrained by the zero lower bound of nominal short-term interest rates.

[3] The existing literature of unconventional monetary policy has paid very little attention to financial structure, implicitly assuming it to be irrelevant.

[4] In the financial structure literature, according to whether finance is conducted by banks or by financial markets, the United States is regarded as *market-based* while Japan is regarded as *bank-based* (see e.g. Allen and Gale, 2000; Demirgüç-Kunt and Levine, 2004).