Summary of "Essays on the Dynamic Effects of Government Spending"

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This dissertation consists of three self-contained essays that investigate the effects of government spending and their determinants. Whilst increased attention has been given to the role of fiscal policy as a stabilization tool after the financial crisis of 2007-08, less theoretical and empirical works has been developed on fiscal policy than those on monetary policy. The past several years have witnessed a rapid advancement of the literature, however, there still remain many questions to be addressed. This dissertation aims to contribute to the literature by providing new empirical evidence and explanation on several major issues related to the effects of government spending. Following a brief introduction (Chapter 1), the transmission mechanism of government spending shocks is examined by using estimated closed and open economy dynamic stochastic general equilibrium (DSGE) models in the first and second essay (Chapters 2 and 3). The third essay investigates possible changes in the transmission by employing a time-varying parameter vector autoregressive (TVP-VAR) approach (Chapter 4). The three essays all point to the importance of fiscal behavior with regard to determinants of the effects of government spending.

Chapter 2 examines the importance of debt-stabilizing tax rules in determining the size of the government spending multiplier by using an estimated New Keynesian dynamic stochastic general equilibrium (DSGE) model of the Japanese economy featuring three distortionary tax rules and non-Ricardian households. The estimated model exhibits positive responses of consumption and output to a government spending shock regardless of its low share of non-Ricardian households. To examine the influence of tax rules on the size of government spending multiplier, we first compare the simulation results under the estimated tax rules for Japan with those under parameters that are adjusted to replicate tax rules estimated for the euro area. The coefficients of the tax rules suggest that debt in Japan is financed largely through capital income taxation, whereas financing in the euro area is instead allocated rather heavily to labour income taxation. The output multipliers of the estimated model are larger in the initial periods than those when the adjusted tax rules for the euro area are employed. To follow, impulse responses to a government spending shock under five alternative financing schemes (consumption tax-financing, labour tax-financing, capital tax-financing, spending reversal, and balanced budget) are considered. It is shown that capital tax financed spending leads to the strongest initial increases in output. Furthermore, we consider the sensitivity of the multipliers to changes in monetary policy parameters to illustrate the role of monetary policy in the estimated model. Under the monetary policy parameters that are adjusted to replicate the

estimates for the euro area, interest rates are raised more aggressively, thereby weakening

intertemporal substitution in consumption after a government spending shock. The increase in

investment is also hampered by the higher interest rate. As a result, the short-run multipliers of

capital tax financed spending are lowered until they become almost equal to those of

consumption and of labour income tax financed spending. Finally, the chapter touches on

medium- and long-run consequences under different financing schemes. A capital tax financed

spending shock induces an investment boom in the initial periods if the speed of fiscal

adjustment is slow. However, as debt is repaid over time, the initial stimulative effects are

dominated by the distortionary effects of capital taxation. Because capital taxation creates

intertemporal wedges, the distortionary effects become excessively greater with longer horizons.

In summary, our sensitivity analysis shows that the government spending multiplier becomes

greater in the short term if the spending increase is initially financed by debt and that debt is

largely repaid via a gradual increase in capital income tax under an accommodative monetary

policy. Capital taxation has the smallest dampening effect on labour input, and the increase in

labour input is the key factor contributing to the effectiveness of fiscal stimulus in a general

equilibrium framework. Although capital income taxation has a dampening effect on investment,

it is possible to have an investment boom in the initial periods after fiscal stimulus if the timing

of capital taxation is sufficiently delayed. This chapter suggests that, overall, distortionary tax

policy rules play a critical role in determining the size of the multiplier in the short term.

Chapter 3 investigates the two fiscal policy puzzles, the anomaly between the standard model predictions and the VAR evidence, and proposes a new but simple approach. First, we present new VAR evidence from Japan on the responses of consumption and the real exchange rate to government consumption and government investment shocks by employing the sign-restrictions approach. In accordance with the results of previous studies on Anglo-Saxon countries, the VAR analysis shows evidence against standard model predictions; consumption increases and the real exchange rate depreciates after both government spending shocks. Although the twin deficits phenomenon appears on impact, the trade balance is likely to improve as the real exchange rate depreciates. Second, we estimate a medium-scale open economy DSGE model introducing (i) non-separability between private and public consumption and (ii) productive public capital, to explain the two puzzles. Using the recently flourishing Bayesian method, we estimate four specifications of the model with and without zero restrictions on the key structural parameters that govern Edgeworth complementarity between private and public consumption, and productive public capital. The posterior odds favor inclusion of non-wasteful nature of government spending, especially the Edgeworth complementarity. Third, we show that the estimated model delivers a crowding-in of consumption and a real exchange rate depreciation

after government spending shocks, in line with the empirical evidence obtained from the VAR analysis. The model also replicates the trade balance improvement in later periods due to the real exchange rate depreciation. While the empirical relevance of spending reversals in government investment is confirmed, their presence does not allow the model to account for the two fiscal policy puzzles. Edgeworth complementarity and productive public capital are shown to be the main contributory sources for generating responses of consumption and the real exchange rate in the empirically-plausible directions following government consumption and government investment shocks, respectively. Furthermore, it should be worth noting that the Edgeworth complementarity also does a good job in explaining the timing of the responses of consumption and the real exchange rate to a government consumption shock with the estimated model. The existing studies have implicitly relied on the tight link between consumption and the real exchange rate to solve the two fiscal policy puzzles. Therefore timing of the responses has not yet been well addressed in these studies. This chapter also shows that the combination of Edgeworth complementarity, home bias, and debt elastic risk premium allows the model to explain the timing of responses of consumption and the real exchange rate to a government consumption shock.

Chapter 4 is based on joint work with Hirokuni Iiboshi of Tokyo Metropolitan University. In it,

we provide new empirical evidence on the evolution of government spending multipliers in the post-war U.S. From a methodological point of view, we present time profile of the changes in multipliers by exploiting a time-varying parameter vector autoregressive (TVP-VAR) framework, instead of relying on sub-sample analysis and regime switching models. Drawing on the findings of previous studies, monetary policy and public debt are considered as promising candidates for the possible driving forces behind the changes in the size of government spending multipliers. Therefore, we work with a medium scale TVP-VAR model that considers monetary variables and public debt. The identification of government spending shocks are achieved by means of sign restrictions in addition to the traditional recursive method. Irrespective of the use of alternative identification schemes, the results document that government spending multipliers have declined substantially since the late 1970s. Furthermore, time profiles of output and consumption responses suggest that the decline in output multiplier is mostly led by that in consumption multiplier. The medium scale TVP-VAR allows us to investigate the possible driving forces behind the changes in the e¤ects of government spending with a help of sign restrictions identification. Considering that a growing body of literature focuses on the size of multipliers across different state of business cycles, we calculate those by imposing additional identification restrictions in the spirit of Canova and Pappa (2011). Although these multipliers are essentially hypothetical in the TVP-VAR framework, we find

larger multipliers in recession and smaller ones in expansion in line with existing literature. The

time profiles of output responses in recession and expansion indicate that those can be viewed

as extreme bounds, and that the state of business cycle plays little role in the time-variation in

government spending multipliers. Calculating the time profiles of price level and interest rate

responses to government spending shocks under different monetary policy scenario, on the other

hand, we find a stable relationship between them, which indicates that monetary policy response

to government spending shocks does not change much throughout the estimation period. It is

also shown that the inflationary effects of government spending shocks become larger since the

late 1970s in accordance with the accumulation of public debt. Finally, the prevalence of either

Ricardian or non-Ricardian fiscal regimes is examined applying the methodology of Canzoneri

et al. (2001) and Canzoneri et al. (2010) to our TVP-VAR framework. The results show that the

degree of Ricardian behavior of the government has been strengthened since the late 1970s,

which corresponds to the period when government spending multipliers declined. The results

lead us to conjecture that the accumulation of government debt during the period may play an

important role in changing the fiscal policy stance, and thus serve as the major driving force for

the observed decline in government spending multipliers. While empirical evidence on the

negative correlation between debt and multipliers has been established for cross-country data,

this chapter provides it by analyzing the U.S. time series data.