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Two fiscal policy puzzles revisited: New evidence and an explanation

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A B S T R A C T

This paper examines two fiscal policy puzzles related to the effects of government spending shocks. Contrary to theoretical predictions, recent empirical evidence suggests a crowding-in of consumption and a depreciation of the real exchange rate after a government spending increase. While several studies have been made to reconcile the conflicting results, this paper provides new time-series evidence and proposes an alternative explanation using the Japanese data. The empirical responses of consumption and the real exchange rate after government spending shocks are shown to be well replicated by an estimated medium-scale open economy dynamic stochastic general equilibrium (DSGE) model augmented with (i) Edgeworth complementarity between private and government consumption, and (ii) productive public capital. Furthermore, sensitivity analysis suggests that the combination of Edgeworth complementarity, home bias, and incomplete asset market allows the model to account for an immediate increase in consumption and for a hump-shaped depreciation of the real exchange rate after a government consumption shock. This result is potentially important in preventing the model from showing the consumption-real exchange rate anomaly after the shock.

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1. Introduction

Fiscal policy has been gaining renewed attention as a stabilization tool after the Lehman shock, since the zero bound on nominal interest rate has become a binding constraint for monetary policy in major industrial countries. With regard to the consequences of fiscal policy, however, there are two major disagreements between theoretical predictions and empirical evidence on the responses of private consumption and the real exchange rate to a government spending shock. A structural vector autoregressive (VAR) analysis tends to find a *crowding-in* of consumption and a *depreciation* of the real exchange rate after an increase in government spending. However, standard dynamic general equilibrium models predict *crowding-out* of consumption in response to a government spending increase, while the textbook IS-LM models predict a positive response of consumption. In addition, both the international real business cycle (IRBC) models and the new open economy macroeconomics (NOEM) models, as well as traditional Mundell–Fleming IS-LM models, predict an *appreciation* of the real exchange rate.

Whereas the first puzzle concerning the response of consumption to a government spending shock has been well recognized and several theoretical attempts have been made to account for the anomalies in a closed-economy setting,[1] the second puzzle, which concerns the response of the real exchange rate, has received less attention, at least until recently. Kim and Roubini (2008), Monacelli and Perotti (2010), Corsetti et al. (2012b), and Ravn et al. (2012) have documented that government spending shocks in one country depreciate its real exchange rate, based on empirical evidence from VAR models. Since their work has been published, reconciliation between the empirical evidence and theoretical predictions has become an important challenge for fiscal policy analysis in an open economy. Several theoretical approaches have been developed; Monacelli and Perotti (2010), Corsetti et al. (2012b), and Ravn et al. (2012) suggest that models augmented with non-separable preferences over consumption and leisure, "spending reversals," and "deep habits" can generate a depreciation of the real exchange rate in response to a government spending shock, respectively. With regard to empirical testing, however, Ravn et al. (2012) is the only study that estimates the key structural parameters of their models.

It is important to note that these approaches solve the first puzzle and the second puzzle simultaneously. They rely on the international risk-sharing condition, which relates dynamics of the real exchange rate to that of consumption in standard IRBC and NOEM models under complete asset market assumption. The condition, however, has been known to cause the *consumption-real exchange rate anomaly* between predictions of open economy models and empirical evidence, also referred to as the *Backus–Smith puzzle*. Backus and Smith (1993) and Kollmann (1995) have independently shown that empirical observations do not provide supportive evidence for a positive correlation between relative consumption across countries and the real exchange rate, as opposed to the predictions of standard open economy models. The above-mentioned approaches that study the two fiscal policy puzzles have focused on generating proper *directions* of the responses of consumption and the exchange rate to a government spending shock in models with complete asset market, in which a crowding-in of consumption is always accompanied by a depreciation of the real exchange rate due to the international risk-sharing condition. Thus, *timing* of the responses has not yet been well considered in the literature so far.

Although the effects of government spending have always been at the center of the policy debate, government spending has been typically modeled as wasteful in most macroeconomic models. In particular, surprisingly very few papers have considered its non-wasteful nature in the context of two fiscal policy puzzles. Linnemann and Schabert (2006) and Bouakez and Rebei (2007) are the early

[1] It has been shown that positive response of consumption to a government spending increase can be generated in a dynamic general equilibrium model by introducing either of the following: (a) non-Ricardian households (Galí et al. (2007)), (b) non-separable preferences over consumption and leisure (Linnemann (2006); Bilbiie (2009); Bilbiie (2011)), (c) "deep habits" (Ravn et al. (2006)), (d) "spending reversals" (Corsetti et al. (2010)), (e) productive public capital (Linnemann and Schabert (2006)), and (f) Edgeworth complementarity between private consumption and government spending (Bouakez and Rebei (2007)).