Consumption, government spending, and the real exchange rate

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ARTICLE INFO

ABSTRACT

Using panel structural VAR analysis and quarterly data from four industrialized countries, we document that an increase in government purchases raises output and private consumption, deteriorates the trade balance, and depreciates the real exchange rate. This pattern of comovement poses a puzzle for both neoclassical and Keynesian models. An explanation based on the deep-habit mechanism is proposed. An estimated two-country model with deep-habits is shown to replicate well the observed responses of output, consumption, and the trade balance, and the initial response of the real exchange rate to an estimated government spending shock.

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1. Introduction

Government spending is one of the main tools of macroeconomic stabilization policy. The vast fiscal stimulus packages enacted in response to the 2008 global recession exemplify the importance that policy makers place on this policy instrument. Therefore it is important to understand the macroeconomic consequences of variations in government spending and the mechanism through which they propagate. This paper presents an empirical and theoretical investigation into the effects of government spending shocks on output, consumption, the trade balance, and the real exchange rate. Our empirical analysis uses quarterly data from a panel of four industrialized countries, the United States, the United Kingdom, Canada, and Australia, over the post-Bretton Woods period and employs a structural vector autoregressive (SVAR) representation of the data. Following Blanchard and Perotti (2002), we identify government spending shocks by assuming that no innovation other than government spending shocks themselves can affect government spending within the quarter. A positive innovation in government spending is found to cause an expansion in output, an expansion in consumption, a deterioration of the trade balance, and a depreciation of the real exchange rate (that is, a decline in domestic prices relative to exchange-rate-adjusted foreign prices).

The effects of government spending shocks on domestic aggregate activity and private absorption have been extensively studied in the related empirical literature. Our finding that government spending shocks raise output and consumption is consistent with previous studies that have used identification assumptions and estimation techniques similar to those we employ in the present paper.[1]

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[1] See, for example, Rotemberg and Woodford (1992), Blanchard and Perotti (2002), Fatás and Mihov (2001), Perotti (2004, 2008), and Galí et al. (2007).

By contrast, the effects of government spending shocks on the external sector of the economy, and in particular on the real exchange rate, have received considerably less attention.[2] The empirical finding of a depreciation of the real exchange rate in response to a positive government spending shock is striking for it goes against the conventional wisdom. The standard view is that an increase in domestic absorption drives up domestic prices rendering the domestic economy relatively more expensive than the rest of the world. Contrary to this view, the data show that conditional on an unanticipated increase in government spending, the economy in which this innovation originates becomes relatively cheaper than its trading partners.

The observed responses of the real exchange rate and private consumption to innovations in government spending are hard to reconcile with the predictions of existing theoretical models of the transmission of government spending shocks. For instance, it is well known that the standard neoclassical model faces serious difficulties explaining the observed expansion in private consumption in response to a positive innovation in government spending. In this model an increase in government spending generates a negative wealth effect that causes an increase in labor supply, a decline in real wages, and a contraction in household spending.

The observed real depreciation of the exchange rate following a positive government spending shock is equally challenging for the neoclassical paradigm. In the absence of home bias, an increase in public consumption generates no changes in international relative prices. As a result the real exchange rate is unperturbed by the fiscal shock. In the presence of home bias, the relative price of domestically produced goods in terms of foreign produced goods increases causing the neoclassical model to predict a counterfactual appreciation of the real exchange rate.

Our empirical findings pose a significant problem not only for the neoclassical model but also for models situated on the other end of the theoretical spectrum. For example, the Mundell–Flemming extension of the IS-LM model, while capturing the increase in consumption, fails to account for the observed real depreciation of the exchange rate triggered by an increase in public consumption. Within this framework, an increase in government purchases produces an expansion in aggregate demand that drives interest rates up. In turn, the elevated level of interest rates attracts foreign capital inflows, which increase the demand for domestic currency resulting in a nominal appreciation of the exchange rate. With product prices rigid in the short run, the nominal appreciation translates into a real appreciation.

Furthermore, more modern versions of the Mundell–Flemming IS-LM model with optimizing households and firms and sluggish nominal price adjustment can be shown to fail to predict a real exchange rate depreciation in response to a government spending increase. For instance, Monacelli and Perotti (2006) study the effects of government spending shocks in the context of a neo-Keynesian open-economy model with sticky prices. These authors show that the neo-Keynesian framework is unable to generate the observed initial real depreciation in response to a positive innovation in government spending. Extensions of the neo-Keynesian open economy model that allows for rule-of-thumb consumers, while being able to explain qualitatively the rise in consumption, have also been shown to face difficulties explaining the observed initial real depreciation (see, for example, Erceg et al., 2005).

A central contribution of our investigation is to advance and test a theoretical explanation for the observed effects of government spending shocks based on the deep-habit mechanism developed by Ravn et al. (2006). To this end, we introduce deep habits into a two-country model. Under deep habits, an increase in domestic aggregate demand provides an incentive for firms selling in the domestic market to lower markups. Thus, an increase in government spending in the domestic economy leads to a decline in domestic markups relative to foreign markups. In this way, the domestic economy becomes less expensive relative to the foreign economy, or, equivalently, the real exchange rate depreciates. At the same time, a decline in domestic markups shifts the labor demand curve outward, giving rise to an increase in domestic real wages. In turn, the rise in wages induces households to substitute consumption for leisure. This substitution effect may be strong enough to offset the negative wealth effect stemming from the increase in public absorption, resulting in an equilibrium increase in private consumption.

The structural parameters defining the deep-habit mechanism are estimated using a limited information approach. The estimation of the model yields substantial support for the presence of deep habits in private and public consumption. The impulse responses of consumption, output, and the trade balance predicted by the deep-habit model are found to match well in size and shape their empirical counterparts. The model also matches the initial response of the real exchange rate. In particular, not only does our theoretical model predict an increase in output and a deterioration in the trade balance in response to a positive innovation in public spending, but also – and more importantly – an expansion in private consumption and an initial depreciation in the real exchange rate. While the model captures well the initial real depreciation of the exchange rate, it cannot explain its considerable persistence.

Section 2 estimates econometrically the effects of government spending shocks on output, consumption, the trade balance, and the real exchange rate using a panel SVAR model. The main difference between our empirical strategy and that adopted in the related literature, e.g., Monacelli and Perotti (2006), Corsetti and Müller (2006), and Kim and Roubini (2008), is our pooling of data across countries. We justify a panel analysis by observing that the identified effects of government spending shocks, particularly on consumption and the real exchange rate, whose behavior is the focus of our study, are similar across the individual countries considered.[3] The purpose of our panel approach is to obtain an efficient estimate of a single benchmark against which to evaluate our proposed theoretical explanation of the transmission of government spending shocks. Section 3 presents a two-country model with deep habits. Section 4 explains at an intuitive level how the deep-habit mechanism affects

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[2] Notable exceptions are Monacelli and Perotti (2006), Corsetti and Müller (2006), and Kim and Roubini (2008).
[3] Country-by-country estimates are available in the supplementary material collected in Ravn et al. (2011) and posted on the website of the JME.