

## Government spending shocks, wealth effects and distortionary taxes

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The effectiveness of government spending in stimulating the economy became a central policy question during the 2008 financial crisis. Whilst proponents and critics argued about the mechanisms determining policy success, standard macroeconomic models generate a wide range of theoretical predictions depending on the assumptions made about how the spending increase is financed and assumptions about how consumers respond to implied future tax increases.

The empirical literature tends to find that GDP increases following a temporary shock to government spending. But from both an academic and policy perspective, an important question is why. And can a relatively standard modern macro model explain the findings observed in the time-series literature? The contribution of this paper is to investigate this issue by constructing and estimating a New Keynesian macro model but particularly focusing on the response of tax rates and debt to government spending and the strength of the so-called ‘wealth effect’ on labour supply.

Many typical models share the ability to replicate the expansionary nature of government spending increases. As is well-known, one of the most important channels is a negative effect on household wealth from higher lump sum taxes that generates a sizable increase in hours worked and output. In reality, however, governments levy distortionary, rather than lump sum, taxes. Moreover, it is not obvious a priori that this ‘wealth effect’ channel — that government spending is expansionary because it makes consumers poorer — is quantitatively important in practice.

Abandoning the lump sum tax assumption has significant implications in standard neoclassical economic models. If the extra government spending is fully financed by distortionary taxes, GDP will fall rather than increase. These negative effects can, however, be offset as more of the spending increase is deficit-financed. Due to so-called Ricardian equivalence effects, deficit-finance in neoclassical models also tends to lead to a wealth effect on labour supply. However, if this channel is weak in practice, even debt financed spending increases could be contractionary: the negative effects of distortionary taxes are likely to dominate. In New Keynesian models these contractionary forces remain strong, although can be somewhat offset by demand effects stemming from sticky prices.

In assessing whether an economic model can account for the empirical evidence and the transmission mechanisms of fiscal policy, it is therefore important to first consider the degree of distortionary tax financing relative to debt financing. Second, to the extent that debt financing plays a role, the wealth effect channel will then be of crucial importance in determining whether the spending increase is expansionary.

First, this paper therefore estimates the empirical effects of a government spending shock in the United States using standard (structural VAR) time series methods. The reason for this is to produce a baseline set of empirical responses as close as possible to the existing literature. However, importantly — and unlike other papers — the response of distortionary tax rates and government debt is estimated. Both debt and taxes are shown to rise following a spending increase, although the increase is more debt financed.

The paper then examines whether, and how, a relatively standard medium-scale New Keynesian macro model can explain the evidence for plausible parameter values. The mix of policy instruments is shown to matter greatly for the sign and magnitude of key responses. For example, greater use of labour income taxes causes a contraction in output, consumption, the real wage and hours, all contrary to the empirical evidence. Furthermore, when only part of the spending increase is financed by distortionary taxes, the wealth effect on labour supply can still play a critical role in boosting output. Without an a priori reason to calibrate these theoretical features in a particular way, this paper empirically investigates these mechanisms for the United States.

The estimated model is shown to match the positive empirical response of key variables to a government spending increase including output, consumption and the real wage, which is a challenge for many New Keynesian models, especially with a realistic set of tax instruments. The estimated model reveals three important reasons why government spending increases are expansionary in the data. First, the wealth effect on labour supply is small. Second, typical mechanisms such as sticky prices, variable capital utilisation, investment adjustment costs and habits all play a role. Third, distortionary tax rates rise following the expenditure shock but their small magnitude crucially reduces the distortions involved. These three results imply that the debt-financed nature of the spending increase is crucial for explaining the expansionary effect, although these expansionary effects do not depend on a wealth effect channel, but rather the presence of sticky prices.