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Fiscal and monetary policy interactions: Empirical evidence and optimal policy using a structural New-Keynesian model

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Abstract

This paper examines the interaction of monetary and fiscal policies using an estimated New-Keynesian dynamic general equilibrium model for the US. In contrast to earlier work using VAR models, we show that the strategic complementarity or substitutability of fiscal and monetary policy depends crucially on the types of shocks hitting the economy, and on the assumptions made about the underlying structural model. We also demonstrate that countercyclical fiscal policy can be welfare-reducing if fiscal and monetary policy rules are inertial and not co-ordinated.

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1. Introduction

Despite the existence of a vast literature on the robustness and optimality of monetary policy rules, relatively little attention has been given to the issue of monetary–fiscal interactions. A number of papers have examined the interdependence between fiscal and monetary policies using New-Keynesian dynamic general equilibrium models,¹ or game-theoretic models,² but none of these models have been tested empirically. In this paper we jointly estimate a small econometric model and monetary and fiscal policy rules for the USA over the sample period 1970–2001. Our structural model is based on a conventional New-Keynesian dynamic general equilibrium (DGE) model.

We use our estimated model to undertake a number of dynamic simulations, examining the responses of the endogenous variables (including the policy instruments) to both exogenous shocks in the structural model equations or unanticipated deviations from the policy rules. In addition, we conduct a number of historical (counterfactual) dynamic simulations, superimposing additional exogenous shocks to existing structural shocks and deviations from the monetary and fiscal rules, to examine how policy-makers might have reacted to different scenarios.

Overall, we find that the systematic responses of fiscal and monetary policy instruments to each other do tend to depend critically on the nature of the shocks hitting the economy. Whilst the New-Keynesian structure of the model suggests a degree of substitutability between the two policy instruments in response to unexpected shocks in the policy rules, our historical simulations show that since the 1990s the two policy instruments have moved together in a more complementary way. To a large extent this is attributable to the nature of the underlying structural and policy shocks, which has changed in the 1990s relative to the 1980s. In particular demand shocks have become more predominant and the variance of deviations from policy rules has been reduced.

Finally, we conduct some normative analysis with our estimated models, to evaluate whether the introduction of endogenous fiscal policy rules markedly changes the optimal monetary policy rule. We thus compare our estimated monetary policy rule with others that can be derived from an optimal control exercise. Interestingly, we find that countercyclical fiscal policy can be welfare-reducing in the presence of optimizing monetary policy-makers.

The rest of this paper is organized as follows. In the next section we will briefly survey the existing literature. In Section 3, we outline the structure of our estimated model and the empirical methodology. In Section 4, we report our estimates and discuss our dynamic simulations, while in Section 5 we focus on optimal policy. Section 6 concludes.

¹ See for example Leith and Wren-Lewis (2000), and more recently Perez and Hiebert (2002) and Zagaglia (2002), who have experimented with DGE model simulations which include some fiscal closure rules, Schmitt-Grohé and Uribe (2002), Benigno and Woodford (2003).

² See Dixit and Lambertini (2000, 2001).

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