



The effectiveness of government debt for demand management: Sensitivity to monetary policy rules



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ARTICLE INFO

Article history:

Received 19 December 2011

Accepted 19 October 2012

Available online 21 February 2013

JEL classification:

E62

E63

Keywords:

Staggered prices

Overlapping generations

Government debt

Fiscal policy effectiveness

Monetary policy rules

ABSTRACT

We construct a staggered-price dynamic general equilibrium model with overlapping generations based on uncertain lifetimes. Price stickiness plus lack of Ricardian Equivalence could be expected to make an increase in government debt, with associated changes in lump-sum taxation, effective in raising short-run output. However we find this is very sensitive to the monetary policy rule. A permanent increase in debt under a basic Taylor Rule does not raise output. To make debt effective we need either a temporary nominal interest rate peg; or inertia in the rule; or an exogenous money supply policy; or to make the debt increase temporary.

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1. Introduction

The recent economic crisis has witnessed a strong reaction of monetary and fiscal policies to support the economy. In many developed countries, the nominal interest rate reached historically low levels. Unconventional monetary policy measures were implemented, together with large fiscal stimulus packages causing a worsening of the fiscal imbalances. A legacy of the crisis so far has been large deficits and major increases in government debt levels across the world.

Not surprisingly, the academic literature has reacted with a renewed interest in monetary and fiscal policy interactions. The main research question regards the size of the fiscal multiplier depending on the particular fiscal instrument used and on the state of monetary policy. Woodford (2011) provides an insightful critical survey of this recent literature on monetary and fiscal policy interactions. (See also Kirsanova et al. (2009)).

All the papers surveyed in Woodford (2011), however, employ the canonical ‘New Neoclassical Synthesis’ (NNS) model for monetary policy analysis that embodies ‘Ricardian Equivalence’. In the standard textbook way, we define a framework to imply ‘Ricardian Equivalence’ if changes in government debt have no real effects on the economy, when accompanied by changes in lump-sum taxation. Given the huge increase in debt which has recently occurred in many developed economies, we would like to focus on the effects of pure government debt changes. Thus, we need a model where changes in government debt – and thus also government budget deficits financed by borrowing – have an interesting and realistic role. In order to do that, the obvious choice, then, is to consider a model of overlapping generations (OLGs). In this paper,

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we hence examine the consequences of combining overlapping generations with staggered price setting for the effectiveness of fiscal policy enacted purely by changing government debt, assuming lump-sum taxation.¹ We show how monetary policy is crucial in shaping the effects of a change in the debt level in this setting. It is worth noting from the outset that, in our framework (and as will be seen), it is the stock of government debt, rather than the size of the deficit, which provides the best single measure of the fiscal stance. Hence we focus on this variable as the primary fiscal instrument.

A plausible hypothesis about the effect of fiscal policy in such an environment might be as follows. A one-period lump-sum tax cut financed by an increase in government debt which is then held permanently at its new higher level would stimulate consumption demand. This is for the standard reason that, although agents would rationally anticipate higher future taxes to service the increased debt interest, a proportion of the taxes would fall on agents not yet born, so that currently-alive agents – the recipients of the tax cut – would perceive their lifetime wealth to have risen. In the presence of temporary nominal rigidities, the increase in aggregate demand would then raise output in a typical Keynesian fashion.

Below, we test this hypothesis by constructing a dynamic general equilibrium (DGE) model with the aforementioned features. Our purpose is analytical rather than empirical: we are not seeking to match our model quantitatively to the data, but to understand qualitatively, and in depth, the economic forces at work. So far as possible we therefore proceed using algebra rather than numerical simulations, although we also make use of the latter. We start by applying the model to the basic fiscal policy experiment just described. Surprisingly, we do not find that an expansionary short-run effect on output is bound to occur. Indeed, in the baseline version of our analysis, a permanent increase in government debt has no short-run effect on output different from its (relatively insignificant) long-run effect. In other words, it causes neither boom nor slump. Such a policy measure is therefore completely ineffective in raising output. This is despite setting it in a macromodel which deliberately incorporates features which might be expected to give it some leverage.

What is the explanation for this ineffectiveness? We show that the critical factor is the monetary policy regime. In our baseline case, we assume a Taylor Rule for monetary policy, i.e. a rule which makes the nominal interest rate a function of current inflation.² In recent years this has become the standard way to represent monetary policy, for reasons which have been widely discussed. In the case of a basic form of the Taylor Rule and a permanent increase in government debt, it is not possible to leave the parameters of the Taylor Rule unchanged if it is desired to ensure a particular level of long-run inflation, such as zero. The ‘intercept’ term in the Taylor Rule has to be increased. This adjustment is the *prima facie* source of the neutralising effect on debt. A deeper discussion is presented in the body of the paper.

This result is striking but one may ask how general it is. We hence proceed to explore ways of escaping from it. First we seek to remain in a regime of Taylor Rules. Empirically realistic Taylor Rules allow for ‘interest-rate smoothing’, such that the nominal interest rate responds only gradually to changes in inflation and output. To study this analytically, we look at a monetary policy in which the nominal interest rate is pegged exogenously at its old level for one or more periods before the basic Taylor Rule takes over. We show that this delay in raising nominal interest rates also delays the rise in the real interest rate, and that this is crucial in enabling government debt to boost aggregate demand. We also allow for gradual adjustment of the nominal interest rate using numerical simulation. We find that when this feature is incorporated, a short-run positive effect of a permanent debt increase on output is again restored. Another possible escape from fiscal ineffectiveness which we consider is to undertake a temporary rather than a permanent increase in government debt. Since the increase is temporary, it is feasible to leave the parameters of the Taylor Rule unchanged while still ensuring zero long-run inflation. We show that a temporary increase in debt does increase short-run output even under the basic Taylor Rule.

A second avenue for exploration is to consider what happens if monetary policy is instead conducted by fixing the money supply, which was the standard assumption until it was displaced by the Taylor Rule. In the later part of the paper we investigate this. A short-run Keynesian boom once more re-emerges, both in response to a permanent increase in government debt, and also to a temporary increase. A comparison of this monetary regime with the Taylor Rule regime enables us to deepen our understanding of why debt can be ineffective in the latter. Under interest-rate control, the money supply is an endogenous variable. In the face of an increase in debt it jumps downward. This avoids the need for a period of inflation in order to reduce the stock of real money balances to its new long-run equilibrium level, and so avoids the need for a boom in output in order to generate such inflation.

Other authors have studied fiscal policy, and its interaction with monetary policy, in DGE models in which ‘Ricardian Equivalence’ does not hold. In particular, various contributions by [Leith and Wren-Lewis \(2000, 2006, 2008\)](#) have covered and highlighted many issues. To our knowledge, however, the potentially drastic effect of a Taylor Rule on the effectiveness of fiscal policy in a non-Ricardian model has not been noted before. A considerable number of papers have examined the determinacy of perfect-foresight equilibrium in DGE models with overlapping generations and money, with or without staggered prices and dynamics of government debt. These include [Bénassy \(2005, 2007b\)](#), [Piergallini \(2006\)](#), [Leith and Wren-Lewis \(2006\)](#) and [Leith and von Thadden \(2008\)](#). [Bénassy \(2007a\)](#) shows that fiscal policy can be effective in a simple Samuelson-type OLG model with one-period price rigidities. [Galí et al. \(2007\)](#) break Ricardian Equivalence by

¹ Obviously ‘non-Ricardian’ effects can be obtained in other ways, such as by the use of distortionary taxes. However, here we deal with changes in government debt under lump-sum taxation in order to focus on a single transmission channel.

² We omit output from the Taylor Rule but its inclusion would not change the result.

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