



# Central bank instruments, fiscal policy regimes, and the requirements for equilibrium determinacy

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## Abstract

This paper examines the role of the monetary instrument choice for local equilibrium determinacy under sticky prices and different fiscal policy regimes. Corresponding to Benhabib et al.'s results for interest rate feedback rules [Benhabib, J., Schmitt-Grohé, S., Uribe, M., 2001. Monetary policy and multiple equilibria. *American Economic Review* 91, 167–185], the money growth rate should not rise by more than one for one with inflation when the primary surplus is raised with public debt. Under an exogenous primary surplus, money supply should be accommodating—such that real balances grow with inflation—to ensure local equilibrium determinacy. When the central bank links the supply of money to government bonds by controlling the bond-to-money ratio, an inflation stabilizing policy can be implemented for both fiscal policy regimes. Local determinacy is then ensured when the bond-to-money ratio is not extremely sensitive to inflation, or when interest payments on public debt are entirely tax financed, i.e., the budget is balanced. © 2006 Elsevier Inc. All rights reserved.

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## 1. Introduction

The central bank can conduct monetary stabilization policy by using different instruments. The choice of a particular instrument can affect its ability to stabilize macroeconomic aggregates and can thus matter for social welfare. This has been shown by Poole (1970), Sargent and Wallace

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(1975), and, more recently, by Carlstrom and Fuerst (1995), Gavin et al. (2005), and Collard and Dellas (2005). These studies do not lead to an unambiguous conclusion about which instrument to prefer. Yet, contemporary research on monetary policy primarily focuses on the analysis of interest rate rules. One major question in this literature is how particular interest rate feedback rules affect local equilibrium determinacy under different specifications of preferences, markets, and technologies.<sup>1</sup> Other studies have shown that equilibrium determinacy is to an important extent affected by interactions between monetary and fiscal policy. Seminal contributions to this literature are Leeper (1991), Sims (1994), and Woodford (1994, 1995), which have established the ‘Fiscal Theory of the Price Level’ (FTPL).<sup>2</sup> According to the FTPL, the price level can be determined by the needs of government solvency when monetary policy fails to provide a nominal anchor. When prices are sticky, fiscal policy can further be crucial for existence and uniqueness of the equilibrium allocation, and can severely constrain the conduct of interest rate policy, as shown by Benhabib et al. (2001). This paper combines the two strands of research, and analyzes the fiscal policy impact on the determination of local equilibrium paths for cases where the central bank applies instruments other than the interest rate.

As the main novel contribution to the literature, this paper examines local equilibrium determinacy under staggered price setting when the central bank adjusts the supply of money in response to changes in inflation under different fiscal policy regimes.<sup>3</sup> We consider the cases where the central bank controls the supply of money either according to a money growth rate rule or according to a rule that links the outstanding stocks of money and government bonds. Like in Benhabib et al. (2001), we further consider fiscal policy regimes that differ with regard to the feedback from public debt to the primary surplus. We find that when the central bank follows a money growth feedback rule, the fiscal stance is decisive for the way the central bank has to adjust the money growth rate in order to ensure local uniqueness of equilibrium. If the primary surplus rises with debt, the government finance decision is irrelevant for the equilibrium allocation and the price system. Local equilibrium determinacy then requires the money growth rate to rise by less than one for one with inflation, implying that real balances decrease with inflation. If the fiscal policy regime is instead characterized by an exogenous primary surplus, fiscal policy matters and government solvency imposes a relevant restriction on the price level and (due to sticky prices) on the equilibrium allocation. Under this fiscal policy regime local equilibrium determinacy requires real balances to increase with inflation, such that unstable debt dynamics are avoided by an accommodating money supply, which devaluates debt. This corresponds to Benhabib et al.’s (2001) result that interest rate policy should be passive when the primary surplus is exogenous.

The conclusions regarding the requirements for local equilibrium determinacy and the role of fiscal policy fundamentally change when the central bank supplies money contingent on the outstanding stock of government bonds.<sup>4</sup> By using the ratio of outstanding bonds to money as

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<sup>1</sup> Examples are Benhabib et al. (2001), Carlstrom and Fuerst (2001, 2005), Dupor (2001a), Woodford (2001), Meng (2002), Brueckner and Schabert (2003), or De Fiore and Liu (2005).

<sup>2</sup> See Kocherlakota and Phelan (1999), Christiano and Fitzgerald (2000), or Woodford (2001) for comprehensive discussions, Buitier (2002) or Niepelt (2004) for critical assessments, and Cochrane (2003) for approval.

<sup>3</sup> Our analysis relates to Black (1974), who examines price level determination when the central bank raises the money growth rate in response to an increase in inflation, and to Woodford (1994), who analyzes determinacy for a constant money growth policy and different fiscal policy regimes in a flexible price framework.

<sup>4</sup> This instrument has also been applied in Wallace (1984), Schreft and Smith (1998, 2000), Bhattacharya and Kudoh (2002), and in Kaas and Weinrich (2003) in flexible price models.

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