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Active and passive monetary policy in an overlapping generations model [☆]

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Abstract

We consider an overlapping generations model in which the growth rate of money is determined either by inflation forecast targeting or by inflation targeting. New money is distributed via lump-sum transfers to old agents. We study how the responsiveness of the policy rule with respect to (expected) inflation affects determinacy and stability of the monetary steady state. A policy rule is called active (passive) if it responds strongly (weakly). Active inflation forecast targeting reinforces mechanisms that lead to indeterminacy. Active inflation targeting, on the other hand, makes indeterminacy less likely but can create instability of the monetary steady state.

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1. Introduction

In recent years, many prominent central banks have adopted inflation targeting or inflation forecast targeting as their preferred framework for the conduct of monetary policy. In a parallel development in the academic literature, instrument rules with varying degrees of responsiveness to inflation or inflation forecasts have been explored across a number of

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different models; see, e.g., Taylor (1999) or Benhabib et al. (2001a). Following this line of research, the present paper studies a standard overlapping generations model under the assumption that monetary policy is implemented through an instrument rule of the form

$$\ln \mu_t - \ln n = \ln g - \eta(\ln \pi_t - \ln g) \quad (1)$$

or

$$\ln \mu_t - \ln n = \ln g - \eta(\ln \pi_{t-1} - \ln g). \quad (2)$$

Here μ_t and π_t are the gross rates of nominal money growth and inflation from period t to period $t + 1$, and n is the (constant) gross rate of population growth. The target for the adjusted nominal money growth rate, μ_t/n , is given by g and the elasticity of the nominal money growth rate with respect to deviations of inflation from target is $-\eta$, where η is a real number greater than -1 .

We refer to (1) as a policy rule for inflation forecast targeting and to (2) as a policy rule for inflation targeting.¹ The reason is that, at the time when the central bank sets the money growth rate μ_t , the most recent observation of inflation is π_{t-1} whereas π_t has not yet been observed and is therefore to be interpreted as an inflation forecast. In other words, Eq. (1) describes a forward-looking policy rule while (2) is a backward-looking one.

The main goal of the paper is to study how the policy parameter η affects the stability and determinacy of the monetary steady state under perfect foresight. If $\eta = 0$, then Eqs. (1) and (2) require the nominal money supply to grow at the constant gross rate $\mu_t = gn$. In other words, $\eta = 0$ corresponds to a regime of strict money growth targeting in which the adjusted nominal money growth rate is fixed at g . For $\eta > 0$, the adjusted nominal money growth rate is decreasing with respect to actual (or expected) inflation. This means that the nominal money supply is contracted if inflation is (expected to be) above target and it is expanded if inflation is (expected to be) below target. If $\eta \in (-1, 0)$, on the other hand, the adjusted nominal money growth rate increases with (expected) inflation but less than one-for-one. We shall call a rule with $\eta > 0$ an active rule and a rule with $\eta \in (-1, 0)$ a passive rule.²

We conduct our analysis in the framework of a standard overlapping generations model. Determinacy and stability of the monetary steady state in this model have been thoroughly investigated under the assumption of a constant money supply or a constant growth rate of the money supply, see, e.g., Azariadis (1993, Chapter 24.1) Policy rules similar to those considered here have been studied in Grandmont (1986).³ The present paper generalizes

¹ Part of the literature reserves the term ‘target variable’ to a variable occurring in a loss function of the central bank. We adopt the alternative definition according to which the expression ‘targeting variable x ’ means ‘using a feedback rule that depends directly on x ’. See Svensson (1999) for a discussion of this terminology.

² The terminology of ‘active’ and ‘passive’ rules was coined by Leeper (1991) to describe the responsiveness of monetary and fiscal policies to government debt shocks. Benhabib et al. (2001b, 2003) have adopted this terminology to describe the responsiveness of monetary policy to the rate of inflation. An alternative terminology would be ‘proactive’ for $\eta > 0$ and ‘accommodative’ for $\eta \in (-1, 0)$. Note furthermore that $\eta > -1$ ensures that real money growth, μ_t/π_t , is always a decreasing function of inflation when (1) is used. An analogous comment applies to (2).

³ We shall describe differences and similarities between our results and those in Grandmont (1986) in Section 2 below.

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