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Optimal monetary policy under low trend inflation ☆

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Abstract

In the monetary policy literature it is common to assume that trend inflation is zero, despite overwhelming evidence that zero inflation is neither empirically relevant nor a practical objective for central bank policy. We therefore extend the standard New Keynesian model to allow for positive trend inflation, showing that even low trend inflation has strong effects on optimal monetary policy and the dynamics of inflation, output and interest rates. Under discretion, the efficient policy deteriorates and there is no guarantee of determinacy. Even with commitment, targeting non-zero trend inflation leads to substantial welfare losses. Our results serve as a warning against indiscriminate use of models assuming zero trend inflation.

JEL classification: E31; E52

Keywords: Optimal monetary policy; Trend inflation

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1. Introduction

In May 2003 the ECB explicitly announced its view that price stability corresponds to an inflation rate of 2% over the medium term. Unfortunately, most theoretical models in the recent literature say little about how a positive inflation target such as this is likely to affect the optimal short-run stabilization policy of the ECB. Indeed, with few notable exceptions (e.g., Khan et al., 2003; Schmitt-Grohé and Uribe, 2004, 2005), the recent literature is typically based on a version of the New Keynesian model that is log-linearized around a zero inflation steady state. This paper aims to solve this inconsistency by addressing the question of how optimal monetary policy is affected by positive trend inflation.[1]

There are two important reasons why the monetary policy literature has focussed on the zero inflation steady state. The first is analytical convenience. The second is that zero inflation is optimal in a so-called cashless economy (see Goodfriend and King, 2001; Woodford, 2003). However, quite special theoretical assumptions are needed before optimal steady-state inflation is equal to zero in any framework.

We think instead that there are compelling reasons to look at the case of *low and positive* trend inflation. First, the case of zero inflation is unrealistic in the light of the post-war economic history of industrialized countries. Schmitt-Grohé and Uribe (2004) use the average US GDP deflator growth rate in 1960–1998 to calibrate the steady-state inflation rate to 4.2%. The average inflation rate for European countries in post-war years ranges from about 3% in Germany to almost 10% in Spain (OECD data). Hence, we should study optimal stabilization policy in such an environment. This is even more important if these models are used empirically to assess the behavior of central banks in the post-war period. Second, the practice of many central banks suggests that zero steady-state inflation is not their real target. In other words, zero inflation does not coincide with the concept of "price stability" held by central bankers, as the ECB case illustrates. It is therefore important to check whether results in the existing literature are robust to *moderately* positive trend inflation levels.

This article owes much to the seminal works of Clarida et al. (1999) and Galí (2003), and can be interpreted as a generalization of their findings to the case of positive trend inflation. Indeed, we provide a simple extension of their framework with the main change being an extra equation that arises when the New Keynesian Phillips Curve (NKPC) is generalized. Our model thus encompasses the standard framework, allowing us to find intuitive analytical results for the case of discretionary monetary policy, and develop straightforward comparisons with standard results.

Our main finding is that optimal monetary policy is highly sensitive to low levels of trend inflation. In particular, as trend inflation increases we find that monetary policy progressively loses its ability to stabilize inflation. The reason is that trend inflation makes firms more concerned that their prices keep up with the trend in inflation, so they are not eroded in relative terms. The optimal reset price is therefore less affected by the current level of economic activity, the NKPC is flatter, and the current output gap has less effect on current inflation. As a result, under positive trend inflation and optimal discretionary policy we find: (i) the rational expectations equilibrium (REE, henceforth) is not always determinate; (ii) the efficient policy frontier deteriorates substantially.

[1] Trend inflation is defined here as the rate of inflation in deterministic steady state.