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The inflation bias when the central bank targets the natural rate of unemployment

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Abstract

This paper studies the proposition that an inflation bias can arise in a setup where a central banker with asymmetric preferences targets the natural unemployment rate. Preferences are asymmetric in the sense that positive unemployment deviations from the natural rate are weighted more (or less) severely than negative deviations in the central banker's loss function. The bias is proportional to the conditional variance of unemployment. The time-series predictions of the model are evaluated using data from G7 countries. Econometric estimates support the prediction that the conditional variance of unemployment and the rate of inflation are positively related. © 2002 Elsevier B.V. All rights reserved.

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1. Introduction

This paper studies the proposition that an inflation bias can arise in a setup where a central banker with asymmetric unemployment preferences targets the natural rate. Preferences are asymmetric in the sense that positive unemployment deviations from the natural rate are weighted more (or less) severely than negative deviations in the central banker's loss function. Since the bias is proportional to the conditional variance of the rate of unemployment, the model generates testable cross-section and time-series implications. In a cross section, countries where unemployment is more variable, should have a higher average rate of price inflation. Evidence supporting this hypothesis is provided by Ruge-Murcia (2002). In a time-series, periods of more volatile unemployment

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should be associated with a higher inflation rate. This prediction is formally examined here using data from G7 countries. Maximum likelihood (ML) estimates support the hypothesis of asymmetric preferences for the United States and France, but not for Canada, Italy, or the United Kingdom.

Previous literature usually assumes that the central banker targets a rate of unemployment strictly below the natural rate. Among others, Persson and Tabellini (2000) note that this assumption is crucial in generating an inflation bias in the linear-quadratic framework of Kydland and Prescott (1977) and Barro and Gordon (1983). The view that the central banker targets a below-natural unemployment rate has been recently challenged on both theoretical and operational grounds. For example, McCallum (1995, 1997) argues that since, in equilibrium, unemployment equals the natural rate but inflation is larger than optimal, the central banker would eventually understand that the unemployment target is unobtainable and revise its goal. King (1996) and Blinder (1998) suggests on the basis of institutional evidence, that the monetary authority actually targets the expected natural rate of unemployment.

The observation that an inflation bias can arise even if the central banker targets the natural unemployment rate was first due to Cukierman (2000, 2002). Cukierman outlines two conditions (both of which are satisfied here) that are required to deliver the result: (i) uncertainty about next period's realizations of inflation and unemployment and (ii) asymmetric unemployment preferences. Using a specification of the loss function where the central banker cares about unemployment only when it is above the natural rate, he finds an inflation bias that is proportional to the probability of a recession. This paper employs a preference specification that nests the usual quadratic loss function as a special case, finds an inflation (or a deflation) bias that is proportional to the conditional variance of unemployment, constructs an econometric framework to examine the model predictions, and provides empirical evidence that the assumption of asymmetric preferences is plausible for some countries in the sample. Finally, this project complements research by Clarida et al. (1999) who show that even when the unemployment target corresponds to the natural rate, there are gains from enhancing the central banker's credibility.

The paper is organized as follows: Section 2 describes the economy and central banker's preferences, finds the subgame-perfect Nash equilibrium, derives conditions for the existence and uniqueness of the equilibrium, and examines the properties of the inflation bias; Section 3 reports empirical estimates; and Section 4 concludes.

2. The model

2.1. *The economic environment*

Following the literature, inflation and unemployment are related by an expectations-augmented Phillips curve:

$$u_t = u_t^n - \lambda(\pi_t - \pi_t^e) + \eta_t, \quad \lambda > 0, \quad (2.1)$$

where u_t , u_t^n , and π_t are (respectively) the rates of unemployment, natural unemployment and inflation, π_t^e is the public's forecast of inflation at time t constructed at time

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