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Nonlinearity in monetary policy: A reconsideration of the opportunistic approach to disinflation☆

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ABSTRACT

The proponents of the 'opportunistic' approach to disinflation suggest that, when inflation is close to the target, the central bank should not counteract inflationary pressures. Orphanides and Wilcox (2002) formalize this idea through a simple policy rule that prescribes a nonlinear adjustment to a history-dependent target for inflation. This embodies a regime change in monetary policy, which reacts to inflation only when this is far from the inflation target. Here we study the opportunistic approach in a New-Keynesian model with sizeable nominal and real rigidites in the form of a positive money demand and adjustment costs for investment. We find that the welfare gains delivered by the opportunistic rule arise from the time-varying inflation target, when welfare is measured by a quadratic approximation of household utility. The nonlinear zone of inaction on inflation improves welfare outcomes only when a central bank loss function with the absolute value of the output gap is used, as proposed by Orphanides and Wilcox (2002).

> "There are genuine issues here about going from moderate inflation to price stability. The public's utility functions – how it values, or ought to value, the extra decline in inflation versus the output lost in getting there – is where the discussion should be, and is the crux of the opportunism versus deliberate policy choice." (Kohn, 1996)

1. Introduction

Former Fed Governors Alan Blinder and Lawrence Meyer have argued in favour of an 'opportunistic approach' to disinflation. In their views, the central bank should not counteract inflationary pressures when inflation is moderately above target. Rather, monetary policy should wait for exogenous shocks to bring inflation back to the target, and focus on output and employment stabilization along the transition. After the disinflation has taken place, the central bank should prevent inflation from rising to its previous levels (see e.g. Meyer, 1996). This lays the ground for a two-tier monetary policy strategy, where the reaction

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of the central bank changes depending the strength of the inflationary pressures.

Orphanides and Wilcox (2002) provide the theoretical foundations for the opportunistic approach. Departing from the linear-quadratic framework, they assume that the loss function of the monetary authority includes the absolute deviation of output from its natural level, along with a history-dependent intermediate target for inflation. These two elements generate a simple policy rule that prescribes a nonlinear adjustment to a time-varying intermediate target for inflation. Policy rates are set depending on a 'zone of inaction'. Within this range of inflation values, the central bank focuses on output rather than inflation stabilization. Instead, when inflation falls outside the zone of inaction, the opportunistic rule prescribes a positive response to the deviations from the target. This generates a switch between two regimes. In one regime, the central bank pursues an activist monetary policy, and actively counteracts the inflationary pressures. In the other, a wait-and-see approach prevails.

To the best of our knowledge, Aksoy et al. (2006) is the only academic contribution on opportunistic policy currently available. Their study considers the long-run implications of the opportunistic approach when inflation ends up outside the zone of inaction. The authors use a small estimated model of the U.S. economy to compare the stochastic distributions of inflation and the output gap arising from the opportunistic rule with those of the policy rule advocated by Taylor (1993).

This paper focuses on the business cycle properties of the opportunistic approach to disinflation. We formulate a calibrated New-Keynesian model with money demand, capital accumulation, nominal and real rigidities. We solve the model through a local approximation method, namely the second-order Taylor expansion proposed by Schmitt-Grohé and Uribe (2004). This allows to incorporate the non-certainty equivalence that characterizes the structural change in the reaction function of the central bank. Moreover, this solution method is well suited for computing optimal monetary policy rules that maximize the intertemporal utility of the households. We also contribute to the available analytical results on second-order approximations by suggesting a numerical strategy for computing the welfare costs of alternative macroeconomic scenarios.

The quantitative findings indicate that the opportunistic rule yields a Pareto-improvement in welfare in comparison with the standard reaction function proposed by Taylor (1993). We also introduce a rule for 'deliberate' disinflation. Differently from the opportunistic approach, under deliberate disinflation, the central bank reacts to all the deviations from a time-varying inflation target. By comparing the macroeconomic performance of the opportunistic and the deliberate disinflation, we can gain insight into the macroeconomic effects of the regime change incorporated in the opportunistic approach. We show that the gains delivered by the opportunistic rule due solely to the time variation of the intermediate inflation target.

Following Aksoy et al. (2006) we then investigate the implications of the opportunistic central bank loss function proposed by Orphanides and Wilcox (2002). We show that in this case, the opportunistic policy rule with a zone of inaction *vis-à-vis* small inflation deviations from target results in lower central bank losses than linear policy rule with a time-varying inflation targets. In this regard, our paper confirms the findings of Aksoy et al. (2006) in a macroeconomic model with explicit micro-foundations. The opportunistic loss function of Orphanides and Wilcox (2002) may be considered a short-cut to account for the indivisibility of labor. Future work of interest would include this indivisibility directly in the microfounded model to account for its welfare implications.

This paper is organized as follows. Section 2 describes the model economy. The calibration strategy is presented in Section 3. Section 4 deals with the computational aspects of this work, including both the approximation technique to the first-order conditions of model and the welfare evaluation. The results are discussed in Section 5. Section 6 proposes some concluding remarks. In Appendix A, we show how to compute our measure of welfare costs. In Appendix B, we discuss the state-space representation of the model.

2. The model

The structure of the model economy is standard in the New-Keynesian tradition (see Woodford, 2003). We consider a closed economy. We include money demand through the money-in-the-utility function approach studied by Feenstra (1986), and quadratic investment-adjustment costs like Kim (2000). Nominal price rigidity arises from quadratic-adjustment costs of changing prices. Although exchange rate interactions can lead to interesting insights (see Laidler, 2005; Trautwein, 2005), we consider the model of a closed economy.

2.1. Households

The model economy is populated by a large number of infinitely-lived agents indexed on the real line, $i \in [0, 1]$, each maximizing the following stream of utility

$$U_{it} = \sum_{t=0}^{\infty} \beta^t \mathsf{E}_t u(c_{it}, m_{it}, \ell_{it}) \tag{1}$$

subjected to the following specification for the instantaneous utility function

$$u\left(c_{it}, m_{it}, \ell_{it}\right) = \frac{1}{1-1/\sigma}\left\{\left[a c_{it}^{\mu-1/\mu} + (1-a)\left(\frac{M_{it}}{P_t}\right)^{\mu-1/\mu}\right]^{\mu/\mu-1}\left(1-\ell_{it}\right)^{\xi}\right\}^{(1-1/\sigma)}. \tag{2}$$

The utility function considers money in a weakly separable form with respect to consumption C_{it}. Consumption and real money balances M_{it}/P_t are valued through an aggregator with constant elasticity of substitution, as described by Chari et al. (2002). The advantage of this