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Inflation inertia and credible disinflation ☆

Guillermo Calvo [a,b], Oya Celasun [c], Michael Kumhof [c,*]

[a] *Columbia University*
[b] *NBER*
[c] *IMF*

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Abstract

We develop a model of optimizing forward-looking staggered price setting where even fully credible disinflations display a delayed and gradual inflation response and significant output losses. There is a welfare trade-off between these output losses and the gains from smaller inflationary distortions. For reasonable parameter values disinflation improves welfare, and more so if it is phased in gradually. The pricing assumption of our model yields dynamics that are similar to models of sticky information, but its state space is much simpler, thereby allowing for the application of standard linearization methods.
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1. Introduction

A large literature on monetary policy analysis uses optimizing dynamic general equilibrium models in which forward-looking agents face nominal rigidities. This literature typically builds on the original time-dependent price adjustment formulations of Taylor (1980), Rotemberg (1982), and Calvo (1983).[1] Whether the inflation specifications derived from such models can fully

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* Corresponding author. International Monetary Fund, Research Department, Modeling Division, 700 19th Street NW, Washington, DC 20431, United States. Tel.: +1 202 623 6769; fax: +1 202 623 6334.
E-mail address: mkumhof@imf.org (M. Kumhof).

[1] Comprehensive surveys can be found in Galí (2002) and Lane (2001).

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account for the short-run empirical properties of inflation and output has recently been much debated.[2] Starting with Fuhrer and Moore (1995) and Fuhrer (1997), rational expectations staggered pricing models have been shown to display a much lower degree of structural inflation persistence than what is found in the data.[3] The absence of structural persistence in these models in turn implies that monetary policy shocks have an immediate impact on inflation, whereas in the data the effects are delayed and gradual (Mankiw, 2001; Mankiw and Reis, 2002a). An important implication of this rapid inflation response is that disinflationary policies are predicted to have minimal real costs, which is also inconsistent with a large body of empirical evidence (Gordon, 1982, 1997; Ball, 1994).[4]

This paper proposes a tractable generalization of the Calvo (1983) staggered pricing model that generates inflation persistence and recessionary disinflations in a fully specified dynamic general equilibrium model where agents are forward looking and have rational expectations. Our model retains the commonly used Calvo (1983) assumption of an exogenous timing of price-changing opportunities. Where we depart from the existing literature is in the specification of price setting behavior. In the realistic case of a positive steady state inflation rate, we suggest that it is plausible to assume that firms employ pricing policies which keep them as close as possible to their flexible price optimum without incurring reoptimization costs. To keep the model tractable, we specifically assume that once a firm gets the chance to change its pricing policies, it jointly and optimally chooses an initial price level and a rate at which it will update its price in the future, a 'firm-specific inflation rate'.[5] This approach differs from two important approaches in the literature. In one (Woodford, 2002) firms choose only a price level without updating. At positive steady state inflation this has been shown to generate a monetary nonneutrality (Rotemberg and Woodford, 1997) where higher steady state inflation implies lower steady state output through increased price dispersion. This nonneutrality is removed in the second approach, starting with Yun (1996), where firms still choose only a price level but update their prices at the steady state inflation rate at all times.[6] But under both of these approaches only the aggregate price level is sticky while inflation is flexible. Credible disinflation policies therefore do not cause recessions.

By contrast, when firms employ pricing rules of the kind proposed in this paper, an unexpected and permanent decline in the steady state inflation rate targeted by monetary policy entails a slow inflation response and output losses, even if the change in policy is perfectly credible. There are two main reasons for this. The first is the lingering effect of historic pricing decisions. The economy initially contains a large number of firms that have chosen their price updating rates under the previous policy, and the weighted average of such updating rates is an important component of

[2] See Taylor (1998) and Clarida et al. (1999) for a review of the empirical successes of this model class, and Rudd and Whelan (2006) for a critical view.

[3] In particular, inflation in these models displays an unrealistically low degree of persistence unless marginal costs are persistent, whereas the empirical consensus is that even serially uncorrelated shocks to marginal costs have persistent effects on inflation.

[4] Another criticism is that these models counterfactually predict that inflation should lead output. Galí and Gertler (1999) and Galí et al. (2001) argue, however that the microfounded versions of the models predict that inflation should lead real marginal costs—for which they provide supporting evidence—and that the dynamic correlation between inflation and output depends on the relationship between output and real marginal costs.

[5] As our pricing rule does not take the simple form of setting new price levels, it is important to stress that our motivation for time-dependent nominal rigidities is not based on menu costs (Akerlof and Yellen, 1985) but instead on reoptimization costs, such as costs of information gathering, decision making, negotiation and communication. The empirical evidence presented by Zbaracki et al. (2004) emphasizes the importance of such reoptimization costs relative to menu costs. See also Christiano et al. (2005) on the reoptimization cost motivation.

[6] Because we allow for updating, our model also removes the nonneutrality.

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