



# Inflation targeting: What inflation rate to target? ☆

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## Abstract

In an economy with nominal rigidities in both an intermediate good sector and a finished good sector, and thus with a natural distinction between CPI and PPI inflation rates, a benevolent central bank faces a tradeoff between stabilizing the two measures of inflation, a final output gap and, unique to our model, a real marginal cost gap in the intermediate sector, so that optimal monetary policy is second-best. We discuss how to implement the optimal policy with minimal information requirement and evaluate the robustness of these simple rules when the central bank may not know the exact sources of shocks or nominal rigidities. A main finding is that a simple hybrid rule under which the short-term interest rate responds to CPI inflation and PPI inflation results in a welfare level close to the optimum, whereas policy rules that ignore PPI inflation or PPI sector shocks can result in significant welfare losses.

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## 1. Introduction

Stabilizing the variability in inflation and the output gap has been an important goal for many central banks around the world. It has also been viewed as the objective of a central bank in most studies of optimal monetary policy rules. In both policy practice and academic research, the inflation target, either explicit or implicit, is almost uniformly measured by the cost of living index, the CPI, even though the cost of production index, the PPI, is also readily observable and the cyclical behaviors of the two measures of inflation are quite different. Table 1 presents evidence that most countries that have adopted an explicit inflation-targeting policy have been targeting CPI inflation or its variants (see also the comprehensive survey in Bernanke et al., 1999), despite the fact that the cyclical behavior of the PPI inflation rate in general differs from the CPI inflation rate in that it is typically more volatile and less persistent (e.g., Clark, 1999);<sup>1</sup> and that, as we show in an inflation-accounting exercise below (Section 8), nominal rigidities in both the CPI sector and the PPI sector play an important role in explaining the dynamic relations between CPI, PPI, and wage inflation observed in the U.S. data.

In the context of the “New Keynesian Synthesis,” many authors have argued that, by stabilizing fluctuations in CPI inflation, the central bank could effectively stabilize the variability of the output gap that measures the deviation of actual output from its natural rate level. If the natural rate is close to being optimal, the argument goes, such a policy would then be welfare improving and hence desirable.<sup>2</sup> The reasoning behind such arguments is typically based on a dynamic general equilibrium model with some sources of nominal rigidity and is thus built on microeconomic foundations. The basic model is flexible enough to allow for several sources of nominal rigidities in the form of sticky prices in multiple sectors (e.g., Mankiw and Reis, 2002) or in multiple countries (e.g., Benigno, 2004; Clarida et al., 2002) or in the form of sticky prices and sticky nominal wages (e.g., Erceg et al., 2000; Amato and Laubach, 2003). An important insight from these studies is that, in the presence of multiple sources of nominal rigidities, complete stability of CPI inflation does not always lead to stability of the output gap because of a tradeoff between stabilizing the output gap and relative price gaps. In a recent survey of this literature, Woodford (2003a, Chapter 6) notes that “the question of which price index it is most desirable to stabilize remains an important topic for further study.”

In the spirit of this strand of literature, our paper analyzes the design and implementation of optimal monetary policy in a DSGE model with multiple sources of nominal rigidities and therefore multiple price indices for the monetary authority to consider stabilizing. As a key point of departure from the literature, however, our model features an input–output linkage between sectors that is supported by empirical evidence yet remarkably overlooked in the literature.<sup>3</sup>

In the model, final consumption goods are produced through two stages of processing. At each stage of processing, there is a continuum of firms producing differentiated goods. The prices of both intermediate production inputs and final consumption goods are

<sup>1</sup>One possible reason why CPI is less volatile than PPI is that the central bank has been targeting CPI. But this pattern holds even for the period in the mid-1930s (see Means, 1935), casting doubt on the role of monetary policy in shaping the cyclical behaviors of CPI and PPI.

<sup>2</sup>See, for example, Clarida et al. (1999), Goodfriend and King (2001), and Woodford (2003a), among others.

<sup>3</sup>For a DSGE model with multiple stages of processing and the implications of the input–output connections on monetary policy transmission, see Huang and Liu (2001) and the references therein.

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