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# Optimal monetary policy responses to relative-price changes<sup>☆</sup>

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## Abstract

An optimizing model, with a flexible-price sector and a sticky-price sector, is presented to analyze the effects of relative-price changes on inflation fluctuations. The relative price of the flexible-price good represents a shift parameter of the New Keynesian Phillips curve. The optimal monetary policy is to target sticky-price inflation, rather than a broad inflation measure. Although stabilizing the relative price around its efficient value is one of the appropriate goals of the central bank, stabilizing sticky-price inflation is sufficient for achieving this goal. An optimal monetary policy for a small open economy is also discussed. © 2001 Published by Elsevier Science B.V.

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## 1. Introduction

Relative prices—for example, of food and energy—, are often discussed in studies of inflation control for two reasons. First of all, relative prices are often

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used as measures of “supply shocks” in “Phillips curve” equations that seek to model the short run output-inflation trade-off.<sup>1</sup> In the empirical literature on the Phillips curve, changes in the relative prices of food and energy are commonly used as a measure of supply shocks, which shift the short-run Phillips curve. Second, many authors have sought to identify a more persistent component of inflation, known as “core inflation”.<sup>2</sup> For the conduct of monetary policy, core inflation is considered a more important indicator than broader inflation measures. In this literature, fluctuations in the prices of food and energy are regarded as a transitory component of overall movements in inflation, since they are thought to be caused mainly by temporary, sector-specific shocks. Based on this idea, it is a common practice to subtract the prices of food and energy from an aggregate inflation measure to calculate a measure of core inflation.

However, it is not obvious how changes in relative prices affect aggregate inflation. Strictly speaking, a pure relative disturbance is a change in supply or demand conditions that leaves the appropriately defined aggregate production possibility frontier unchanged. In the absence of price stickiness, this shock should not change aggregate real output and the aggregate price level.<sup>3</sup> It is also not obvious how relative-price changes are related to supply shocks. Large changes in relative prices are not necessarily caused by large supply shocks. Relative prices are affected by several factors other than supply shocks, such as demand shocks and elasticities of substitution among goods. These arguments suggest that the appropriate measures of supply shocks and core inflation should be based on a structural model which identifies the factors that affect relative-price changes and the persistent component of aggregate inflation.

In this paper, we construct a two-sector dynamic general equilibrium model, with a flexible-price sector and a sticky-price sector. The model is a variant of optimizing models with nominal price stickiness, that have recently been used in the literature on inflation dynamics and monetary policy.<sup>4</sup> Using this model we discuss the correct specification of the Phillips curve in the presence of sectoral shocks, and show in what way changes in the relative price of flexible-price good shift the short-run Phillips curve. We also show that the inflation in the sticky-price sector represents a persistent component of inflation, in the

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<sup>1</sup> See, for example, Ball and Mankiw (1995) and Roberts (1995).

<sup>2</sup> See, for example, Bryan and Cecchetti (1994), and Cecchetti (1997).

<sup>3</sup> Gordon (1975) is a classic paper which studies the interaction between the relative prices of food and energy and aggregate inflation. A paper by Ball and Mankiw (1995) argues that, under the existence of menu costs for changing prices, the skewness of the distribution of relative price changes is positively related to aggregate inflation.

<sup>4</sup> See, for example, Clarida et al. (1999), Woodford (1996), Rotemberg and Woodford (1997, 1999). Although their focus is different from ours, Ohanian et al. (1995) construct a model with a sticky-price sector and a flexible-price sector.

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