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# Real exchange rate persistence and monetary policy rules

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## Abstract

The objective of this paper is to analyze the effects of alternative monetary rules on real exchange rate persistence. Using a two-country stochastic dynamic general equilibrium with nominal price stickiness and local currency pricing, we will show how the persistence of purchasing power parity deviations can be related to a monetary theory of these deviations. When monetary policy lean against the wind, there is no relationship of proportionality between the time during which prices remain sticky and the persistence of the response of the real exchange rate: in this case high nominal price rigidity is not sufficient, per se, in generating any persistence following a monetary shock. Moreover, we emphasize the role of interest rates smoothing policies and relative price stickiness within countries in understanding the relationship between the real exchange rate and monetary shocks. With reasonable parameters values, a wide range of monetary policy rules can generate real exchange rate autocorrelations around the ones observed in the data.

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## 1. Introduction

Is it possible to generate persistence in the real exchange rate without assuming implausible values for nominal price rigidities?

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Recently several papers have attempted to address the issue of large and persistent deviations of the real exchange rate from purchasing power parity (PPP). As Rogoff (1996) underlines, short-term exchange rate volatility can be explained in terms of monetary shocks while the rate at which PPP deviations damp out may be rationalized if real shocks are predominant.

How is it possible to reconcile in a common framework, the enormous short-term volatility of the real exchange rates with the extremely slow rate at which shocks appear to damp out? This is the purchasing power parity puzzle.

Models based on sticky prices are one explanation offered for these real exchange rate movements: monetary shocks induce an immediate change of the nominal exchange rate that translates into a change in the real exchange rate as long as national prices adjust slowly. In this spirit, the papers by Bergin and Feenstra (2001), Chari et al. (2002), Kollmann (2001) and Tille (1998) have shown how implausibly long-lasting contracts are needed in order to generate the observed persistence.

The purpose of this paper is to show that the persistence of PPP deviations is not necessarily inconsistent with a monetary theory of these deviations. In particular we explore the role of a systematic monetary policy behavior, modelled through interest-rate feedback rules, in rationalizing the observed dynamics of the real exchange rate.

We will demonstrate that, under systematic monetary policy, while price stickiness is a necessary condition for monetary shocks to have real effects, high nominal price rigidity is not sufficient, per se, in generating any persistence following a monetary shock. This result implies that, when monetary policy leans against the wind and as long as monetary shocks are serially uncorrelated, the real exchange rate does not exhibit any persistence no matter how high is the degree of nominal price rigidity.<sup>1</sup>

How is then possible to generate persistence?

We highlight the role of two new factors in explaining the observed persistence in the real exchange rate. When monetary policy is conducted in an “inertial” way, i.e. the adjustment of the instrument toward its target is smoothed over time, then the real exchange rate exhibits persistence because, through the interest rate differential, its adjustment is also smoothed over time.

Moreover, we emphasize the role of the relative duration of nominal contracts within countries in understanding the relationship between the real exchange rate and monetary shocks. Inertia in relative prices (e.g. in the ratio of imported versus domestically produced goods) can be generated when the expected duration of the corresponding nominal contracts is different. Relative prices’ inertia induces inertia in the inflation rates and this transfers into a persistent behavior of the real exchange rate.

After calibrating the model, we illustrate how various rules are able to replicate the autocorrelation observed in the data. We do not assume high nominal price rigidity: the maximum expected duration of a price is of five quarters. For a wide range of rules, we obtain an autocorrelation coefficient that varies around 0.78. These rules

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<sup>1</sup>A related result is obtained for GNP persistence by West (1988).

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