

Can trade costs explain why exchange rate volatility does not feed into consumer prices?[☆]

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Abstract

If countries specialize in imperfectly substitutable goods, trade costs increase the share of expenditure devoted to domestic output, reducing the exposure of consumer price inflation to exchange rate changes. I present a multi-country flexible-price model where expenditure shares are inversely related to trade costs through a gravity equation. In this setting, consumer price inflation can be approximated as an expenditure-share-weighted average of the contributions to inflation from all countries. I use data from 24 OECD countries, 1970–2003, to estimate a structural gravity model. I combine the fitted expenditure shares from the estimation with actual data on exchange rates to construct predictions of inflation. The behavior of these predictions indicates that trade costs can explain both qualitatively and quantitatively the failure of exchange rate volatility to feed into inflation.

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1. Introduction

Since [Mussa \(1986\)](#) pointed out that the behavior of real exchange rates differs sharply across exchange rate regimes, many papers have documented that the volatility of floating nominal exchange rates neither reflects nor feeds back into the volatility of other macroeconomic variables. [Baxter and Stockman \(1989\)](#) “find little evidence of systematic differences in the behavior of macroeconomic aggregates” such as output, consumption, trade flows and government consumption across exchange rate regimes, despite the big differences in real exchange rate behavior. [Flood and Rose \(1995\)](#) update the evidence and come to the same conclusion. The extent to which nominal exchange rate changes feed into inflation in particular has been examined in detail by the literature on testing for purchasing power parity. The conclusion of this literature, as

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summarized by [Froot and Rogoff \(1995\)](#), and more recently by [Taylor and Taylor \(2004\)](#), is that exchange rate changes feed into inflation slowly at best.

Explanations for the failure of exchange rate volatility to feed back into inflation and other macro variables can be divided into two categories. The first are based on failures of the law of one price at the level of individual goods due to sticky prices or pricing to market. The second category consists of those that rely on composition effects when individual goods are imperfectly substitutable. This category includes home bias in preferences, non-traded goods, distribution costs, and trade costs. The first set of explanations face the problem that the order of magnitude of exchange rate variation requires firms to support large and persistent deviations of prices from marginal cost. They are also somewhat at odds with evidence that suggests that pass-through of exchange rate changes into import prices at the border is relatively swift (e.g., [Campa and Goldberg, 2005](#)). Moreover, [Atkeson and Burstein \(2007\)](#) demonstrate that, for shocks of small magnitude, the net effect of pricing to market on real exchange rate volatility may be small.

The second category of explanations does not suffer from these problems and has had some empirical success. [Hau \(2002\)](#) presents a model in which openness to trade depends on preferences, and feedback from exchange rate volatility to inflation is increasing in openness. The prediction that real exchange rate volatility is decreasing in openness is confirmed in the data. The distribution cost literature (e.g., [Burstein et al., 2003](#); [Campa and Goldberg, 2006](#); [Corsetti and Dedola, 2005](#)) provides evidence that measured costs of distribution can go a substantial way towards explaining the sluggish response of consumer prices to exchange rate changes. The drawback to both of these explanations is that a country's degree of openness is treated as exogenous. In contrast, the advantage of an explanation based on trade costs is that openness is modeled as endogenous, depending on both size and distance from other countries.

The trade cost hypothesis has been previously highlighted by [Obstfeld and Rogoff \(2000\)](#), who discuss the possible role of trade frictions in explaining several puzzles in international finance, including the exchange rate disconnect puzzle. Several authors have investigated the quantitative importance of trade costs in two-country calibration exercises ([Betts and Kehoe, 2001](#); [Atkeson and Burstein, 2007](#)). These authors find that trade costs are important in explaining real exchange rate behavior. However, to date, no one has undertaken a cross-country exploration of the ability of trade costs to explain quantitatively the failure of exchange rate volatility to feed back into inflation. The contribution of this paper is to do just this.

I quantify the effect of trade costs on the feedback from exchange rates to inflation using a partial equilibrium calibration exercise. To motivate this exercise, I present a multi-country model with specialization in imperfectly substitutable goods, and costly trade (a structural “gravity” model). Pass-through of exchange rate changes at the border is assumed to be instantaneous. In this framework, consumer price inflation can be approximated as an expenditure-share-weighted average of the contributions to inflation from all the countries from which goods are imported, including the home country. The expenditure shares are a function of the output of the exporting country, of the bilateral trade cost between importer and exporter, and, in the case of preference heterogeneity, of preference parameters.

Based on this approximation of inflation, I construct “predictions” of CPI inflation using weighted averages of actual data on exchange rate changes and GDP deflator inflation. By using three different sets of weights, I can impose three different sets of assumptions about preference heterogeneity and trade costs. Measured expenditure shares (“actual shares”) capture all possible determinants of differences in expenditure patterns, including different preferences, non-traded goods and distribution costs. Shares constructed from the fitted values from a gravity model of trade (“gravity shares”) impose the assumption that expenditure patterns differ because of trade costs alone. The case of zero trade costs (and no other sources of cross-country expenditure differences) is captured by using shares of world GDP as weights (“GDP shares”).

The first and second moments of these three sets of predictions are compared with the moments of actual CPI inflation. The volatility of the actual shares' and gravity shares' predictions closely matches the volatility of CPI inflation—the actual shares' prediction is on average only 6% more volatile than actual inflation, while the gravity shares' prediction is 8% more volatile. Meanwhile, the GDP shares' prediction is considerably more volatile than CPI inflation—on average 125% more volatile. I conclude that trade costs can go a long way towards explaining the low feedback from exchange rate volatility to CPI inflation. Moreover, I demonstrate that the role of trade costs in shifting expenditure away from imports towards domestic output is

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