Exchange rate pass through, macro fundamentals and regime choice in Latin America

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ABSTRACT

The impact of changes in exchange rate on inflation is an issue of extreme importance for nations with a history of high inflation. While there have been significant studies on industrial and advanced economies, little analysis has been conducted on smaller economies that are open to trade and financial relationships. This paper estimates exchange rate pass-through (ERPT) into CPI and import prices from 1970 to 2010 for nine Latin American nations. ERPT is further estimated for each decade documenting declining pass-through after the turn of the millennium. The paper also examines the impact of macro fundamentals on ERPT, and finds monetary policy stability, inflation rate and trade openness to have a positive impact on pass-through. Finally, *de facto* exchange rate flexibility indices are constructed and ERPT rates are found to negatively affect them.

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1. Introduction

A perennial but crucial source of inflation for most economies is through the foreign exchange market channel. Exchange rate pass-through (henceforth ERPT) refers to the transmission of changes in exchange rate into both destination-market currency import prices as well as into aggregate domestic prices. Increasing integration of economies with other nations; the dismantling of both real and financial sector barriers with the onset of globalization have raised interest among researchers and policymakers in analyzing different aspects of ERPT.

The extent of pass-through has important policy bearings. Small, open emerging economies are typically price takers in world markets and are more susceptible to inflation pass-through. On one hand, a high degree of ERPT raises concerns of "importing inflation from abroad" and allows for a direct transmission of shocks from partner nations. This is in turn affects a nation's choice of exchange rate regime. The issue is particularly important for countries in Latin America, a region with a history of high inflation. On the other, lower pass-through slowers the external adjustment of a nation.

This paper contributes to the literature in three main dimensions. I first estimate the degree of ERPT into both consumer and import prices for Argentina, Brazil, Bolivia, Chile, Colombia, Ecuador, Mexico, Peru and Uruguay both as a panel and individually, spanning the last four decades. Unlike other studies I look at a longer time horizon and specifically examine if the extent of pass-through has declined over time. Secondly, I examine how the underlying monetary policy environment has

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affected ERPT. Thirdly, I analyze the effect of pass-through on the *de facto* degree of exchange rate flexibility. My analysis includes the relatively larger economies of the region as well as the seldom researched smaller ones.

Recent literature shows growing evidence that ERPT is declining over the time for several advanced and industrial nations. This is attributed to the changing composition of a nation's imports away from raw materials and energy imports towards manufacturing goods that have more competitive markets, and the practice of "local-currency-pricing" (setting of prices in the destination market currency). Empirical evidence of this is found by Campa and Goldberg (2005), Takhtamanova (2010) for OECD nations; Otani et al. (2003) for Japan and Marazzi et al. (2005) in the case of the US.[1]

At the aggregate level analysis of ERPT into CPI or even import prices recent studies further emphasize on the role of a nation's underlying macroeconomic fundamentals. The more stable a country's monetary policy and the lower its rate of inflation; the lower will be the extent of exchange rate pass-through (Taylor, 2000). For a country with low inflation, the perceived persistence to changes in exchange rate is less. Thus, given most firms sets prices in advance, foreign exporters are less likely to pass through changes in exchange rates. This in turns helps in sustaining low inflation and makes monetary policy more effective. As such there may be a "virtuous circle" between stable monetary policy and low exchange rate pass-through. This thesis has been confirmed by using macro-level data for industrial countries by Gagnon and Ihrig (2004), Choudri and Hakura (2006); and others.

The bulk of the ERPT literature to date has been focused on the US and other industrial countries. However, given the history of high inflation, the extent of inflation pass-through and their underlying determinants are key areas of policy concern to the Latin American region.

Notable findings in this paper are threefold. First, I find inflation pass-through to decline for the last decade. Second, monetary policy stability, inflation rates and trade openness are found to have a positive and significant effect on pass-through. Lastly ERPT rates negatively affect the degree of *de facto* exchange rate flexibility.

The remainder of the paper proceeds as follows. Section 2 presents the data, empirical model, and discusses the pass-through estimates. Section 3 examines the impact of the macro fundamentals on ERPT rates. Section 4 analyses the relationship between ERPT and exchange rate flexibility. Finally concluding comments are provided in Section 5.

2. Pass-through in Latin America

In related studies on ERPT in Latin America, Akofio-Sowah (2009) estimates inflation pass-through of NEER for 12 nations from 1980 to 2005. Using a single equation approach and a fixed as well as random effects model, the author finds an ERPT elasticity of 20%. Inflation rates and exchange rate volatility are further found to have a positive and negative impact, respectively, on ERPT, while trade openness is found to be insignificant in affecting ERPT. Belaisch (2003) finds ERPT to fall for Brazil from July 1999 to December 2002, compared to the earlier decade. García and Restrepo (2001) using quarterly data from 1986 to 2001 for Chile finds ERPT into CPI to depend positively on economic activity. Moreover, using a rolling regression method, the authors similarly finds ERPT rates to decline from 1996 onwards. Goldfajn and Werlang (2000) estimates inflation pass-through for a panel of several Latin American countries over the period 1980–1998 and finds an ERPT rate of 1.24.

My interest in the empirical analysis lies in covering the entire post Bretton Woods till date. Moreover, this study encapsulates the complete first decade of the new millennium where there is scant literature. I estimate both short and long-run ERPT rates into consumer and import prices of both the bilateral nominal exchange rate per unit of the US dollar as well as the nominal effective exchange rate for a panel of several Latin American countries. The analysis is also conducted for each decade to investigate if pass-through rates have declined over time.

2.1. Data

Data on CPI (IFS, line 64), import prices (line 75d or 76x), national currency per unit of USD (line ae), NEER (line nec), and real GDP (line 99bvp) are sourced from the IMF's *International Financial Statistics* (IFS). Real GDP is used to measure output. If the latter were not available I used either the industrial (66c) or manufacturing production indices (line 66ey). Mexico's import price and effective exchange rate series have been source from the *Bank of Mexico*. While data for bilateral exchange rates and CPI are available for all nine nations from 1970Q1-2010Q1, import prices data were available only for five countries – Argentina Brazil, Chile, Colombia and Mexico; and nominal effective exchange rate data were available for Bolivia, Brazil, Chile, Colombia, Mexico and Uruguay only. Several time series were riddled with large gaps and discontinuities which posed a significant challenge. Table 1 summarizes the data series for each nation along with their summary statistics.

2.2. Econometric model and methodology

I use the following ERPT estimation equation similar to Gopinath et al. (2010), Campa and Goldberg (2005), Mumtaz et al. (2011).

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[1] Other factors that might have contributed to declining ERPT include cross-border "production fragmentation," which refers to the dispersion of the production process among different countries (see Ghosh, 2009) and the process of international globalization itself (Gust et al. 2010).