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# Exchange-rate volatility in Latin America and its impact on foreign trade

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**Abstract**

This paper investigates empirically the impact of real exchange-rate volatility on the export flows of eight Latin American countries over the quarterly period 1973–2004. Estimates of the cointegrating relations are obtained using different cointegration techniques. Estimates of the short-run dynamics are obtained for each country utilizing the error-correction technique. The major results show that increases in the volatility of the real effective exchange rate, approximating exchange-rate uncertainty, exert a significant negative effect upon export demand in both the short-run and the long-run in each of the eight Latin American countries. These effects may result in significant reallocation of resources by market participants.


*JEL classification:* F11; F17
*Keywords:* Exchange-rate variability; Exports; Latin American countries; Cointegration; Error-correction model

## 1. Introduction

The impact of increased exchange rate variability on foreign trade has been investigated in a large number of empirical and theoretical studies.[1] The issue is particularly important for countries that switched from a fixed to a flexible exchange rate regime due to the higher degree of variability associated with flexible exchange rates. While many Latin American countries have moved to a flexible exchange rate regime at some point in the recent past[2], it is surprising that there are very few studies that analyze the relationship between exchange rate variability and foreign trade for Latin American countries.[3]

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[1] Empirical papers on the issue include, among many others, Kenen and Rodrik (1986), Cushman (1988), Qian and Varangis (1994), Lee (1999), Doyle (2001), and Baum, Caglayan, and Ozkan (2004), while examples of theoretical contributions are Ethier (1973), Hooper and Kohlhagen (1978), De Grauwe (1988), Baldwin and Krugman (1989), Viaene and de Vries (1992), and Barkoulas et al. (2002). Surveys of the literature can be found in Côté (1994) and McKenzie (1999).

[2] The fact that some Latin American countries pegged their currency against the U.S. dollar for certain periods, such as Argentina from 1991 to 2001, does not invalidate the above statement since the real effective exchange rate used in this study continues to vary due to the fact that other Latin American countries have chosen to float their currencies against the dollar.

[3] Seabra (1995) provides estimates of the expected short-run exchange-rate uncertainty for 11 Latin American countries, but does not apply his measure to the question of trade and exchange rate variability.

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The purpose of this paper is to close this gap and provide estimates of the short- and long-run impact of exchange rate variability on export flows for eight Latin American economies.

In estimating these effects, we follow the approach introduced by Arize, Osang, and Slottje (2000) who examine the impact of exchange-rate volatility on the export flows for thirteen LDCs using both cointegration and error-correction techniques. Based on that approach, we find that the variability of the real exchange rate had a negative effect on export demand for all Latin American countries in our sample, both in the short and the long run. This result is quite surprising given that most countries in this study are middle-income economies according to World Bank classification and thus should have forward markets that would allow traders to hedge transaction exposure. But, as our results show, even fairly developed economies may not be able to completely insulate real economic flows from the fluctuations in international financial markets, and, as a result, these countries have to bear the negative consequences of such fluctuations.

Our results are on the whole consistent with the scant evidence on the relationship between exchange rate variability and export behavior of Latin American countries obtained by previous studies. Coes (1981) uses a log-level specification to examine Brazilian exports (annual data for 1965–1974) and concludes that a significant reduction in exchange-rate uncertainty in the country's economy during the crawling-peg era had a positive effect on the country's exports after the crawling peg was adopted in 1968. The study by Brada and Mendez (1988) includes 15 Latin American countries and covers the 1973–1977 period. While their conclusion is similar to ours, namely that exchange-rate uncertainty inhibits bilateral exports, they do not use a measure of exchange-rate volatility, but instead rely on a various dummy variables to account for the effects fixed versus flexible exchange rate regimes. Caballero and Corbo (1989) use a Koyck-type model and real bilateral exchange-rate volatility measure to estimate an export demand equation for six countries, among them Chile, Colombia, and Peru. They conclude that there is a strong negative effect of real exchange-rate uncertainty on the exports of all these countries.

Furthermore, the empirical results derived in this paper are also consistent with recent studies showing a significant negative (long-run) impact of exchange-rate volatility on export flows for developing countries outside of Latin America (e.g., Arize et al., 2000; Bahmani-Oskooee, 2002).[4]

The remainder of the paper is organized as follows. In Section 2, we examine the specification of our empirical model followed by a discussion of econometric methodology issues. Data sources and variable definitions are described in Section 3. In Section 4, we discuss the empirical results for the eight countries. Conclusions are drawn in the last section.

## 2. Model specification

A common specification of export demand in the flexible exchange-rate environment is[5]:

$$Q_t = \tau_0 + \tau_1 \cdot w_t + \tau_2 \cdot P_t + \tau_3 \cdot \sigma_t + EC_t, \tag{1}$$

where $Q_t$ denotes the logarithm of a country's exported goods, $w_t$ is the logarithm of a scale variable which captures world demand conditions; $p_t$ is the logarithm of relative prices and is measured by the ratio of that country's export price in U.S. dollars to the world export price in U.S. dollars; $\sigma_t$ is a measure of exchange-rate risk; and $EC_t$ is a disturbance term. It is expected that $\tau_1 > 0$; $\tau_2 < 0$; and $\tau_3 <$ or $> 0$.

If foreign economic activity rises, the demand for exports will rise, so $\tau_1$ is expected to be positive. On the other hand, if relative prices rise, the demand for exports will fall, so $\tau_2$ is expected to be negative. Most empirical work treats exchange-rate volatility as a risk: Higher risk leads to higher cost for risk-averse traders and also to less foreign trade. This is because the exchange rate is agreed on at the time of the trade contract, but payment is not made until the future delivery actually takes place. If changes in exchange rates become unpredictable, this creates uncertainty about the profits to be made and, hence, reduces the benefits of international trade. Exchange-rate risk for developing countries is generally not hedged because forward markets are not accessible to all traders. Even if hedging in the forward markets

[4] The evidence for industrialized countries is mixed. Chowdhury (1993), Arize (1995), and Choudhry (2001) report a negative impact, while Qian and Varangis (1994) and Baum et al. (2004) find a negative effect for some countries and a positive for others. Doyle (2001) finds that in the case of Irish–U.K. trade positive effects predominate.

[5] To conserve space, no theoretical discussions on the relationship between foreign income or relative price variables and foreign trade are presented here. A treatment of this issue can be found in Arize (1990).