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Industry trade and exchange-rate fluctuations: Evidence from the U.S. and Chile

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ABSTRACT

In recent years, research on the effects of currency movements on trade has used disaggregated data and error-correction and cointegration models. The resulting short-run and long-run estimates can be used to isolate not only specific industry responses, but also dynamic effects such as the "J curve." This study examines the United States' trade balance with Chile, both at the aggregate level and for 49 individual industries. Of the 40 cointegrated industries, only ten improve in the long run after a depreciation, and only nine exhibit the temporary deterioration and eventual improvement typical of a "J curve." We find that most effects concentrated among certain manufactures, with agricultural products and raw materials responding less to currency movements than do other commodities.

1. Introduction

As a mechanism of export promotion, perhaps no policy has received as much attention among policymakers as the "competitive devaluation." Latin America has been no stranger to such a policy. Even under the regime of floating rates to which most advanced economies have subscribed over the past few decades, a depreciation due to market forces is often thought to have beneficial effects on a country's exports and eventually GDP.

For so long, economists have sought to understand the conditions under which such currency declines might have a positive effect on a country's trade balance. While long-run effects are clearer (and described by the well-known Marshall–Lerner condition), short-run effects might not be as beneficial. In particular, because of adjustment lags such as contracts that take time to fulfill, trade quantities might adjust more slowly than trade values might do. As a result, a currency depreciation might result in a fixed quantity of imports costing more, with exports receiving a lower price. These combine to temporarily reduce a country's trade balance before all variables can adjust. The reduction, followed by an increase, is often referred to as a "J curve" pattern.

Literature reviews by Bahmani-Oskooee and Ratha (2004) and Bahmani-Oskooee and Hegerty (2010) describe much of the empirical research that has been conducted on this phenomenon. In general, support for the J-curve has often been weak, a finding that has been attributed to the fact that aggregate data might hide patterns that occur only for some of the constituent

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countries or industries. As a result, recent research has sought to disaggregate trade flows by country and by individual industry, so that specific products' responses to currency movements might not be obscured by those that exhibit no response. In much of the literature, only a fraction of industries exhibit a long-run improvement to the trade balance after a depreciation, and even fewer show a J-curve pattern.

Many current studies employ time-series error-correction and cointegration models, which capture short-run as well as long-run responses to a devaluation. This allows for two possible definitions of the phenomenon to be examined. According to one definition, a J-curve is present if there is a negative coefficient at very short lags, with a positive coefficient following at longer lags. A later definition incorporates long-run coefficients; per the definition by Rose and Yellen (1989) and Rose (1990), there is a J-curve if negative short-run coefficients are followed by a positive long-run coefficient.

Recent research has also begun to address reasons why certain industries respond to currency movements and others do not. In particular, Bahmani-Oskooee, Bolhassani, and Hegerty (2011) focus on two characteristics: Industry classification (such as raw materials versus manufactures) and industry size (as a share of total trade). These are often important in describing disparate results.

Much of the literature, which has greatly expanded in its coverage of bilateral trade pairs, has indeed found different results by country and by commodity. This is also true for Latin American trade, which has begun to receive attention at the commodity level. For example, Bahmani-Oskooee and Hegerty (2011) examine trade between the United States and Mexico for 102 individual industries. Only 27 register significant long-run improvements after a depreciation of the peso, and only seven of these have the requisite short-run results that show that they follow a J-curve pattern. Bahmani-Oskooee, Bolhassani et al. (2011) look at Mexican trade with Canada from 1973 to 2006, and find that while relatively few industries respond to exchange-rate movements overall, the Machinery and Transport Equipment sector responds positively in the long run, and certain manufactures follow a J-curve pattern.

Other country pairs, outside of Latin America, have arrived at similar results. Examples include Bahmani-Oskooee and Hegerty (2009), who look at trade between the United States and Japan; Bahmani-Oskooee, Hegerty, and Xu (2011), who examine trade between China and Japan; and Bahmani-Oskooee, Harvey, and Hegerty (2013) for the case of Spain and the United States. Overall, most industries do not respond to depreciation in the long run, while a larger share tend to do so in the short run. These limited industry-level results tend to manifest themselves as an insignificant aggregate result, which highlights the importance of using commodity data in such studies. It also shows that each country pair must be investigated individually so that its own particular characteristics can be analyzed.

This paper does so for the case of trade between Chile and the United States. While primarily a commodity exporter, Chile still provides important manufactures to its Western Hemisphere trading partners. The dollar–peso real exchange rate is shown in Fig. 1. The peso appears to rise and fall with world commodity prices, particularly in 2007 and 2008, which confirms the Chilean peso's status as a "commodity currency."

We estimate a trade model for the U.S. aggregate trade balance with Chile, as well as for 49 individual industries, using annual data from 1980 to 2011. Cointegration analysis shows that a number of industries exhibit a short-run relationship between the trade balance and the real exchange rate, while fewer industries (and not aggregate trade) improve in the long run after a depreciation. Of the 49 industries, only nine fit either definition of the "J curve." Interestingly, we find that miscellaneous manufactures (SITC Sector 8) are more sensitive than other categories of goods to exchange-rate movements.

This paper proceeds as follows. Section 2 describes the empirical methodology, and Section 3 provides the results. Section 4 concludes, and our data are described in the Appendix.

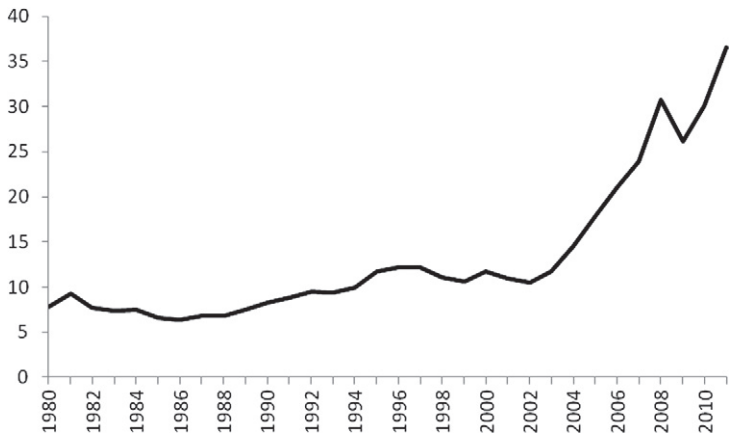

Fig. 1. Dollar–peso real exchange rate, 1980–2011. Calculated using data from the IFS.