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Exchange-rate volatility and export performance: Do emerging market economies resemble industrial countries or other developing countries?☆

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ABSTRACT

Authors who do not distinguish between Emerging Market Economies (EMEs) and other developing countries, find evidence of negative and significant effects of exchange-rate volatility on trade. We investigate the effects of real exchange-rate volatility on exports of ten EMEs and eleven other developing countries that were not classified as EMEs over our estimation period. We use panel-data sets that cover the periods 1980:Q1–2006:Q4 for the EMEs and 1980:Q1–2005:Q4 for the other developing countries. We use two estimation methods — generalized method of moments (GMM) estimation and time-varying-coefficient (TVC) estimation. The TVC procedure removes specification biases from the coefficients, revealing the underlying stable parameters of interest. We obtain similar results as previous authors for only the eleven non-EME developing countries we consider. In contrast, our results for the EMEs do not show a negative and significant effect of exchange-rate volatility on the exports of the countries considered. Our findings suggest that the open capital markets of EMEs may have reduced the effects of exchange-rate fluctuations on exports compared with those effects in the cases of other developing countries.

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1. Introduction

Since the breakdown of the Bretton-Woods system of pegged-but-adjustable exchange rates in 1973, a considerable empirical literature has sprung-up investigating whether exchange-rate volatility decreases trade. The motivation for research into this issue is the hypothesis that exchange-rate volatility introduces an element of uncertainty into conducting business across borders and this uncertainty decreases trade, thereby decreasing economic welfare.[2] Until the late 1990s, the empirical literature concentrated mainly on industrial countries; reflecting a lack of time-series data pertaining to them, particularly high-frequency data, developing countries received much less attention than their industrial-country counterparts. By-and-large, a general conclusion that emerges from the empirical literature dealing with industrial countries' trade is that the relationship between exchange-rate volatility and trade is ambiguous, with many studies finding no significant effect or, where the effect is significant, it is neither predominantly positive nor negative.[3] With the increasing availability of data, particular at higher (e.g., quarterly) frequencies, for developing countries, a number of recent studies have examined the effects of short-term volatility of exchange rates on the exports (or trade) of various groups of developing countries.[4]

Table 1 summarizes the results of studies, published between 1999 and 2008, that focus exclusively on the relationship between exchange-rate volatility and trade of developing countries. The overall thrust of these results is that exchange-rate volatility had a negative and significant effect on the exports of the countries considered, regardless

☆ The views expressed are those of the authors and should not be interpreted as those of their respective institutions.

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[2] An early exposition of this view was provided by Williamson (1983). As we point-out in Section 2, analytically also, the relationship between exchange-rate volatility and trade is not clear-cut.

[3] Surveys of earlier literature include IMF (1984) and Edison and Melvin (1990). The more-recent literature is surveyed by McKenzie (1999), Clark, Tamirisa, and Wei (2004), and Bahmani-Oskooee and Hegerty (2007). McKenzie (1999), in his survey of 31 empirical studies, listed only two that included developing countries in the data sets.

[4] In investigating whether short-term volatility of exchange rates affects the volume of trade, it is desirable to estimate relationships at as high a frequency as the available data permit. Studies that use annual data are likely to capture medium- or long-term movements in exchange rates, not short-term volatility. Proponents of exchange-rate management have argued that, individually, both short-term volatility and longer-term misalignment of exchange rates decrease trade. See Williamson (1983).

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of the sample period, data frequency, model specification, country coverage, and estimation method. Of the 14 studies listed in Table 1, authors of 13 studies found some negative and significant effect of exchange-rate volatility on trade.

Authors who study the effects of exchange-rate volatility on exports of groups of developing countries often include emerging market economies (EMEs) in their sample of developing countries. Yet, there are reasons to believe that the effects of exchange-rate volatility on exports of EMEs may differ from the effects of such volatility on exports of other developing countries. Therefore, it may not be appropriate to consider EMEs and other developing countries together. EMEs are considered to be in transition between developing- and developed-country status. They are defined to be *upper-income* developing countries with relatively-open capital markets (IMF, 2007, pp. 206–08). That is, unlike many other developing countries, including some high-income, oil-exporting developing economies, EMEs are "heavily involved with private international markets" (Goldstein, 2002, p. 1).[5]

This paper studies the relationship between exchange-rate volatility and exports of (1) EMEs and (2) other developing countries using panel-data sets constructed by the authors covering the periods 1980:Q1–2006:Q4 and 1980:Q1–2005:Q4, respectively.[6] Our panel of EMEs consists of Argentina, Brazil, Hungary, Israel, Korea, the Philippines, Singapore, South Africa, Thailand, and Turkey.[7] Our panel of developing countries consists of Bolivia, Colombia, Costa Rica, Dominican Republic, Ecuador, Guyana, Malawi, Morocco, Pakistan, Paraguay, and Venezuela. We use two estimation methods: generalized method of moments (GMM) estimation and time-varying-coefficient (TVC) estimation. Although GMM estimation has become a workhorse technique in the empirical literature because it takes into account the endogeneity of the explanatory variables, the estimation procedure does not remove specification biases from the coefficients. Unlike GMM estimation, the TVC approach starts from the assumption that any econometric model is almost certainly a misspecified version of the truth.[8] This misspecification may take the form of omitted variables, endogeneity problems, measurement errors, and incorrect functional forms. These problems are expected to produce estimated coefficients that are unstable and time-varying. The TVC technique tries to identify the causes of coefficient variation by using a set of "driving" variables — or, coefficient drivers. The technique involves two steps (performed simultaneously): (a) the estimation of a model with coefficients that are allowed to vary as a result of the fundamental misspecifications in the model, and (b) the identification of the specification biases that affect the underlying coefficients and the removal of these biases. If the procedure is followed successfully, we obtain a set of biased coefficients containing measurement-error and omitted-variable biases and a set of bias-corrected coefficients; the latter reveal the underlying bias-free coefficients stable parameters of interest.[9]

The remainder of this paper is divided into four sections. Section 2 provides an overview of analytic aspects concerning the relationship between exchange-rate volatility and trade for the ten EMEs and eleven other developing countries considered here. Section 3 discusses the estimated model and data. Section 4 presents empirical results. Section 5 concludes. The Appendix provides a comparison of the TVC and GMM estimation methods.

2. Analytical considerations

The *theoretical* literature concerning the effects of exchange-rate volatility on trade typically reveals no unambiguous response in the level of trade to a change in exchange-rate volatility (McKenzie, 1999; Clark, Tamirisa and Wei, 2004). A conclusion that emerges from the literature is that differing analytic results can arise from differences in assumptions with regard to such factors as the degree of risk aversion of, and the availability of hedging opportunities, and/or the presence of other types of business risk to economic agents involved (or potentially involved) in international trade (Sauer and Bohara, 2001; Hondroyiannis et al., 2008). Consequently, the direction and extent of any relationship between exchange-rate volatility and trade is an empirical question (e.g., Sauer and Bohara, 2001, p. 133).

A common feature that characterizes earlier (i.e., pre-late 1990s) analytic assessments of the relationship between exchange-rate volatility and trade is that the countries under consideration were almost exclusively industrial countries. There are several potential reasons, however, that there may be differences between the relationship between short-term exchange-rate volatility and trade of industrial countries and developing countries, including EMEs.[10] In what follows, we first compare factors that may help distinguish the effects of exchange-rate volatility on the exports of industrial countries from the effects of such volatility of the exports of EMEs. Next, we consider factors that may help set EMEs apart from other developing countries.

2.1. Industrial countries versus EMEs

Over the period examined in this study, the real exchange rates of the EMEs tended to fluctuate more in the short run than did those of the industrial countries (see below). That fact, coupled with the thinness of the foreign-exchange markets for the currencies of the former countries relative to those for the latter, made hedging against movements in exchange rates more expensive for exporting firms in, and purchasers from, EMEs than is the case for industrial-country exporters and their trading partners. Moreover, EMEs tend to be more- open with respect to trade than their industrial-country counterparts, so that a given magnitude of exchange-rate volatility is apt to have a larger effect on the trade of EMEs than on that of the latter countries. While a substantial part of the exports of the EMEs is priced in foreign currencies, often the U.S. dollar, short-term exchange-rate fluctuations can affect the willingness of firms in EMEs to produce for the export market since a large portion of their inputs, including labor, is priced in local currency. The sensitivity of costs to the exchange rate may lead to a negative relationship between short-term fluctuations in exchange rates and export volumes.

The forgoing analysis pertains to "normal" times, but, for many of the EMEs the exports of which are under study here, much of the period covered by this analysis was anything but "normal." Many of the countries considered here experienced episodes of severe international and domestic financial and economic dislocation during the sample

[5] Goldstein (2002) provided the following list of 24 EMEs: Argentina, Brazil, Chile, China, Colombia, the Czech Republic, Hong Kong, Hungary, India, Indonesia, Israel, Malaysia, Mexico, Pakistan, Peru, the Philippines, Poland, Russia, Singapore, South Africa, South Korea, Thailand, Turkey, and Venezuela. This list is almost identical to that provided by the IMF (2007).

[6] The difference in the end-points of the sample periods is attributable to differences in the availability of data.

[7] Clearly, the classification of countries as EMEs is time-variant. Some of the countries classified as EMEs during the latter part of our sample period may not have been so-classified in the early part. The choice of the particular sample of ten EMEs was dictated by the availability of data at a quarterly frequency. To our knowledge, no previous study has used a panel-data set to evaluate the effects of exchange-rate volatility on exports of EMEs. Egert and Morales-Zumaquero (2008) constructed a panel-data set of eight transition economies and found substantial evidence of a negative and significant effect of exchange-rate volatility on exports. Using time-series data, however, Egert and Morales-Zumaquero (2008) obtained mixed evidence pertaining to the effect of volatility on exports.

[8] See Hondroyiannis, Swamy and Tavlas (2009). To our knowledge, no other study dealing with developing countries has used either GMM estimation or TVC estimation.

[9] See Swamy and Tavlas (2001, 2007).

[10] Hausmann et al. (2000) and Calvo and Reinhart (2001) put forth the view that exchange-rate volatility has a larger adverse impact on foreign trade in developing countries than in industrial countries.

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