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Exchange-rate risk and U.S.–Japan trade: Evidence from industry level data

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ABSTRACT

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Since the Bretton Woods system of fixed exchange rates broke down in 1973, the resulting increase in exchange-rate variability has introduced uncertainty into trading relationships worldwide. Has this increased volatility had an effect on Japanese–U.S. trade? To answer this question, we apply cointegration analysis to disaggregated export and import data for 117 Japanese industries from 1973 to 2006. We find that in the long run, the trade shares of most industries are relatively unaffected by increased uncertainty, while other industries experience a relative increase or decrease in their proportion of overall trade. In the short run, some industries are influenced by exchange-rate volatility, but this effect is often ambiguous. Japanese exports of certain manufactures seem to improve in the long run relative to overall trade flows. *J. Japanese Int. Economies* **22** (4) (2008) 518–534. The Center for Research on International Economics, The University of Wisconsin–Milwaukee, P.O. Box 413, Milwaukee, WI 53201, USA.

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1. Introduction

One of the most important risks involved in international trade is the change in price that can be caused by currency fluctuations. If the exchange rate fluctuates after a trader agrees to trade with a foreign merchant, this alters the actual price that the trader pays or receives. The possibility of paying more may cause the trader to refrain entirely from this exchange, thus reducing the volume

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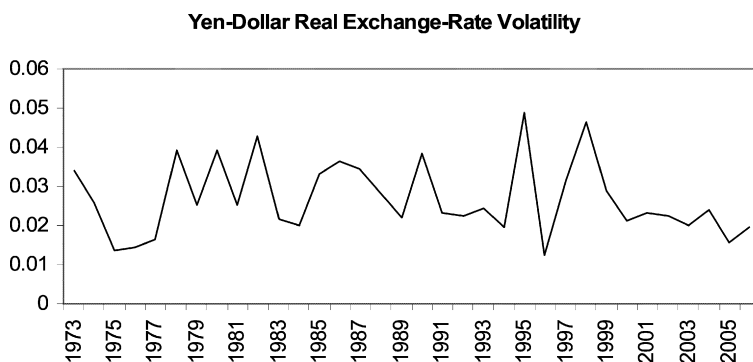


Fig. 1. Yen-dollar real exchange-rate volatility, 1973–2006. Standard deviations of the monthly percentage changes in REX, the CPI-based yen-dollar real exchange rate. *Source:* International Financial Statistics of the IMF.

of exports or imports. On the other hand, a risk-loving trader might choose to exchange more in the hopes of paying less and thus gaining from currency fluctuations. Either way, exchange-rate volatility, which has increased greatly since the breakdown of the Bretton Woods system of fixed exchange rates in 1973, has been shown to have had a profound impact on the volume of exports and imports worldwide.

The presence of risk tends to reduce economic activity in general. In the case of exchange-rate volatility and trade flows, however, trade does not necessarily decrease. The theoretical and empirical literature, reviewed by Bahmani-Oskooee and Hegerty (2007), shows both justification for and evidence supporting decreases, increases, or no change at all as a result of increased exchange-rate risk. Results might vary further when specific country pairs or goods are considered. In addition, disaggregating data by country or by individual goods might uncover effects that are obscured when the aggregate data are studied.

In this paper, we assess Japanese trade with the United States, of 117 specific commodities, over the period 1973–2006. The main destination of Japanese exports, and the second source of the country's imports (behind China), the United States is important for Japanese trade. Thus, this study provides key insight into this highly productive trading relationship. In addition, certain goods—such as automobiles—have long played a key role in Japan–U.S. trade. While a number of empirical studies have investigated the effects of exchange-rate volatility on Japanese exports and imports, few have examined the impact of risk on specific goods. While their results tend to be mixed, the studies have generally found that exchange-rate volatility reduces the volume of trade.

Fig. 1 shows that the yen-dollar real exchange rate has been highly volatile in recent years.

Early studies examined Japan's aggregate trade with the rest of the world, often using a variant of ordinary least squares (OLS) to test models that include a number of explanatory variables. These usually fail to find significant effects. Gotur (1985), for example, extends the model of Akhtar and Hilton (1985), which models trade as a function of importer's income, capacity utilization, relative price, and risk. She finds that the effect of volatility is significantly positive for Japan's aggregate exports, but insignificant for imports. Bailey et al. (1987) run 33 OLS regressions for the exports of 11 OECD countries and find that Japan's volatility coefficients are all insignificant. Using a more sophisticated time-series econometric methodology, Kroner and Lastrapes (1993) apply the ARCH-in-mean approach to Japanese aggregate exports to the rest of the world. They also find the results to be insignificant.

As insignificant aggregate results might be blamed on the "aggregation bias," many later studies focused on bilateral trade flows. As a main trading partner of the United States, Japanese trade is often examined in the context of studies of U.S. bilateral trade flows. These results are again mixed, but lean negative. Cushman (1988), testing a model similar to that of Akhtar and Hilton (1985), assesses U.S. exports to and imports from Japan (as well as to five other industrial countries), again using OLS. Using five different proxies for volatility, he finds that four produce significantly positive coefficients for exports, and three proxies produce significantly negative coefficients for imports. Perée and Steinherr (1989) also find that Japanese exports to the United States were reduced due to volatility.

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