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The contribution of the yen appreciation since 2007 to the Japanese economic debacle

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ABSTRACT

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The Japanese yen in 2012 remained 25% above its value in 2007. Exports, industrial production, and stock prices crashed after 2007 and had yet to regain their pre-crash values five years later. This paper investigates the contribution of the yen appreciation to this economic disaster. Evidence from Johansen maximum likelihood and dynamic ordinary least squares (DOLS) estimation indicates that a 25% appreciation reduces long run exports by 8–18%. Panel DOLS evidence reveals that the appreciation especially depressed exports in the automobile sector. Regression evidence implies that the yen appreciation caused yen export prices to fall 29% in the automobile sector and 22% in the electrical and electronics sector. Finally, evidence from estimating exchange rate exposures indicates that the yen appreciation reduced stock prices significantly in the automobile and electronics sectors. *J. Japanese Int. Economies* **31** (2014) 1–15. Research Institute of Economy Trade and Industry, Tokyo, Japan.

1. Introduction

The Japanese real effective exchange rate appreciated 30% between June 2007 and March 2009. Japanese real exports fell 40% over this period, industrial production dropped 35%, and the Nikkei index lost more than 80% of its value. Five years later the yen remained strong and exports, industrial

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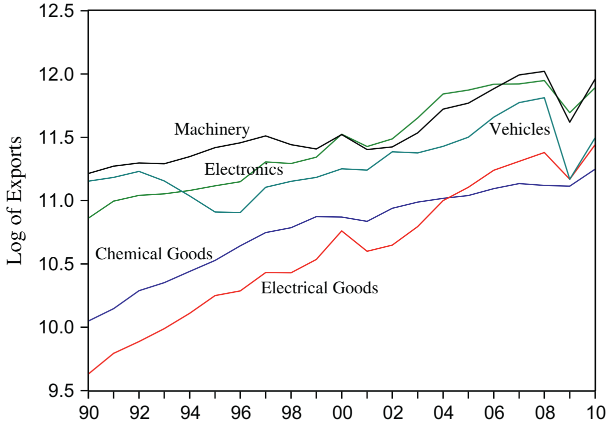

Fig. 1. The value of Japanese exports disaggregated by sector. *Source:* CEPII-CHELEM database.

production and stock prices had not yet regained their pre-Crisis values. How did the strong yen contribute to this debacle?

There are several channels through which an appreciation of the yen could affect Japanese firms. It could cause exports to fall because Japanese firms lose their price competitiveness. It could harm Japanese enterprises if they are unable to pass-through exchange rate changes into foreign currency prices. It could reduce the stock prices of Japanese companies that are exposed to exchange rate changes. It could cause Japanese multinational companies to move production overseas.

This paper investigates the first three channels.[1] To examine how the strong yen has affected Japanese exports, Johansen maximum likelihood estimation and dynamic ordinary least squares (DOLS) techniques are used. The results indicate that there are cointegrating relationships between Japanese aggregate exports, the real effective exchange rate, and real income in importing countries. The evidence indicates that a 10% appreciation of the yen in the long run is associated with a steady state decrease in exports of between 3% and 7%. The findings also indicate that the gap between actual and long run exports closes at a rate of about 30% per quarter. From this perspective, the 50% drop in exports between 2008:III and 2009:II can be viewed as an overshooting relative to fundamentals and the 40% rebound between 2009:II and 2011:IV as a return to equilibrium. The fact that the volume of exports in 2011:IV remained 10% below the volume in 2008:III reflects the fact that the yen has remained strong.

Fig. 1 shows that the drop in Japanese exports across sectors has been uneven. The value of chemical exports did not fall between 2008 and 2009, while the value of machinery exports fell 40% and the value of vehicle exports fell 63%. Exports for all the sectors in Fig. 1 except vehicles rebounded in 2010. For vehicles, exports in 2010 remained 32% below their 2008 values. To help understand these patterns, panel data sets including Japanese exports by industry are employed. Results from panel DOLS estimation indicate that exchange rate elasticities are zero for chemical exports and are large for vehicle exports. In general, industries with larger exchange rate elasticities experienced greater drops in exports during the crisis.

Fig. 2 shows the evolution of yen prices and yen costs for Japanese exports since 2005. Yen costs are proxied by the domestic corporate goods price index. The figure shows that yen export prices increased relative to yen costs until June 2007. After this, the yen began a sustained appreciation and yen export prices tumbled. Between June 2007 and May 2012, yen export prices fell 28% more than yen costs. This has squeezed profit margins for Japanese firms. This paper presents evidence on the fall in yen export prices relative to yen costs for individual sectors between June 2007 and May 2012 and also between January 2005 and May 2012. The second period includes the time before the crisis when yen prices were increasing relative to yen costs. In principle Japanese firms could have

[1] For evidence on the fourth channel, see Thorbecke (2008) and Thorbecke and Salike (2012).