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# Do Chinese and Korean products compete in the Japanese market? An investigation of machinery exports

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### ABSTRACT

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The purpose of this paper is to examine whether and to what extent Chinese and Korean products in the machinery industry compete with each other in the Japanese market. Empirical tests of panel data of 16 machinery products from 2000Q1 to 2012Q2 show that a decrease in the unit prices of Chinese exports leads to a decrease in the demand for Korean exports. In contrast, a decrease in the unit prices of Korean exports does not lead to a decrease in the demand for Chinese exports. In addition, lagged Chinese prices have bigger impacts on current Korean prices than lagged Korean prices on current Chinese prices. Simulation experiments investigating the impacts of a change in exchange rates on the Chinese and Korean export volumes also confirm that the Korean variables do not affect the Chinese export volume as much as the Chinese variables affect the Korean export volume. Overall, the findings in the present paper indicate that China has already emerged as a formidable competitor to Korea in the Japanese machinery market. *J. Japanese Int. Economies* 34 (2014) 256–271. School of International Liberal Studies, Waseda University, 1-6-1 Nishi-Waseda, Shinjuku-ku, Tokyo 169-8050, Japan.

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## 1. Introduction

The purpose of this paper is to examine whether and to what extent Chinese machinery commodities are competing with Korean machinery commodities in the Japanese market. Specifically, it considers the cross-price elasticity in the export function of each country to determine whether the unit prices of one country affect the exports of the other country. In addition, the impact of exchange rates on unit prices is investigated to understand whether exchange rates affect export volumes through price changes.

Since China started participating in the international trade market, the displacement effect of Chinese exports has been an important research topic because of other Asian countries' great concern that China's emergence might crowd out their exports in the world market. The research papers that explored this issue in the first place report that the emergence of China had only harmed less-developed Asian countries (Bhattacharya et al., 2001; Eichengreen et al., 2004, 2007). More recent papers, however, pay attention to the structural transition of Chinese exports from labor-intensive products to high-tech products (Wang and Wei, 2008) and argue that China is competing not with less-developed Asian countries but with developed Asian countries such as Japan, Korea and Singapore (Greenaway et al., 2008).

In fact, even in 2006, when China was still behind Korea in its industrial structure and technology, Kim et al. (2006) show that China's export structure was becoming similar to that of Korea and Japan. They argue that these structural changes could turn China into Korea's major competitor in the near future. In a study performed seven years later, Berger and Martin (2013), after analyzing China's disaggregated export data, report that almost half of Chinese export growth between 2000 and 2007 is accounted for by machinery exports, the growth of which was concentrated in a few specific high-technology products such as cell phones, LCD displays, and laptops. As is well known, those products have also been Korea's main export goods.

Korea's competition with China in the world market should be an important issue in understanding the entire economy of Korea, considering Korea's heavy dependence on external demands and the increasing similarity between the export structures of the two countries.<sup>1</sup> According to the data of the IFS, the export over GDP ratio of Korea increased from 38.6% in 2000 to 56.5% in 2012. Moreover, according to the data of RIETI-TID, in 2011, machinery goods accounted for 51.8% of China's total exports and 59.9% of Korea's total exports, implying that they should be competing in the world market. The same database also shows that the major exporting sectors in the Korean machinery industry are general and electrical machinery sectors, which are also major exporting sectors in the Chinese machinery industry. The two sectors accounted for 78.1% and 64.0% of the total Chinese and Korean machinery exports in 2011, respectively. However, despite the importance of the issue, our understanding of the details of the competition between China and Korea in the world market is still quite limited.

Against this background, the present paper aims to contribute to our understanding of the issue by exploring the machinery exports of China and Korea in the Japanese market.<sup>2</sup> The machinery industry<sup>3</sup> is the biggest export engine of both China and Korea in the Japanese market. In 2011, the share of the machinery industry in China's total exports to Japan was around 43% and that of Korea around 33%. As Fig. 1 shows, the machinery share of China's exports has continually increased since 2000, while that of Korea was between 40 and 50% from 2000 to 2010. This share in Korea declined to 33% in 2011, not because Korea's machinery exports to Japan decreased but because Korea's exports in some other sectors, such as food and chemicals, increased more rapidly due to the huge earthquake on March 11 of that year.

<sup>1</sup> China and Korea not only compete but also cooperate economically through their production networks. Therefore, understanding the impacts of Chinese variables on the Korean economy requires consideration of the cooperation part, too. Even though this paper focuses solely on the competition part and a discussion of production networks is beyond its scope, the impact of production networks is briefly examined when the estimation results are presented in Section 3. For various aspects of East Asian production networks, see Athukorala (2012), Eichengreen and Tong (2007), Kimura and Obashi (2011), and their references.

<sup>2</sup> One benefit of selecting the Japanese market is that we can concentrate on the competition between China and Korea by excluding their common competitor, Japan, in other foreign markets.

<sup>3</sup> In this paper, the machinery industry means the sectors with HS codes ranging from 84 to 93. The trade data between China/Korea and Japan were obtained from the Trade Statistics of Japan Customs.

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