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Asymmetric effects of exchange rate changes on the Malaysia-China commodity trade

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ABSTRACT

Previous research that considered the response of the trade balance between Malaysia and China to exchange rate changes used a linear model and did not find any significant long-run link. Suspecting that the results suffer from aggregation bias as well as ignoring nonlinear adjustment of the exchange rate, we consider the trade balance of 59 industries that trade between the two countries and use a nonlinear ARDL model to show that almost a third of the industries are affected by ringgit depreciation against the yuan, in an asymmetric manner. The largest industry, which accounts for more than 25% of the trade, is found to benefit from ringgit depreciation while not being hurt by appreciation. In total, 15 industries that account for 40% of the trade enjoy this property.

1. Introduction

The economic success of Malaysia is due to its transition from an agriculture-based economy to an industry-based economy with a substantial part of its external trade. It has achieved success in specializing in high-tech goods such as electrical and electronics and built a comparative advantage in exporting such manufactured goods, more to other Asian countries than to the U.S. and the European Union. Today, the largest export market for Malaysia happens to be China. Indeed, in terms of aggregate trade, China is Malaysia's largest trading partner. Therefore, it is important to determine if there is any role for the ringgit-yuan exchange rates in the trade between the two countries. In order to see how the real ringgit-yuan exchange rate has moved over time, we plot that rate in Fig. 1.

How has the Malaysian-Chinese trade balance responded to movements in the real ringgit-yuan rate? Has real depreciation of the ringgit against the yuan played any significant role in improving Malaysia's competitive position and therefore its trade balance with China?

In trying to answer the above question, a common practice by economists is to infer the size of trade elasticities, summarized by the well-known Marshall-Lerner condition. This condition asserts that as long as the sum of the absolute value of price elasticities of import demands is greater than one, depreciation will improve the trade balance in the long run. In the distant past, the condition was mostly estimated for industrial countries due to the availability of data. Recent studies, however, have included countries from the developing world. Examples are Khan (1974), who estimated the condition for 15 countries, and Bahmani-Oskooee (1986), who did it for seven developing countries. Bahmani-Oskooee and Niroomand (1998)

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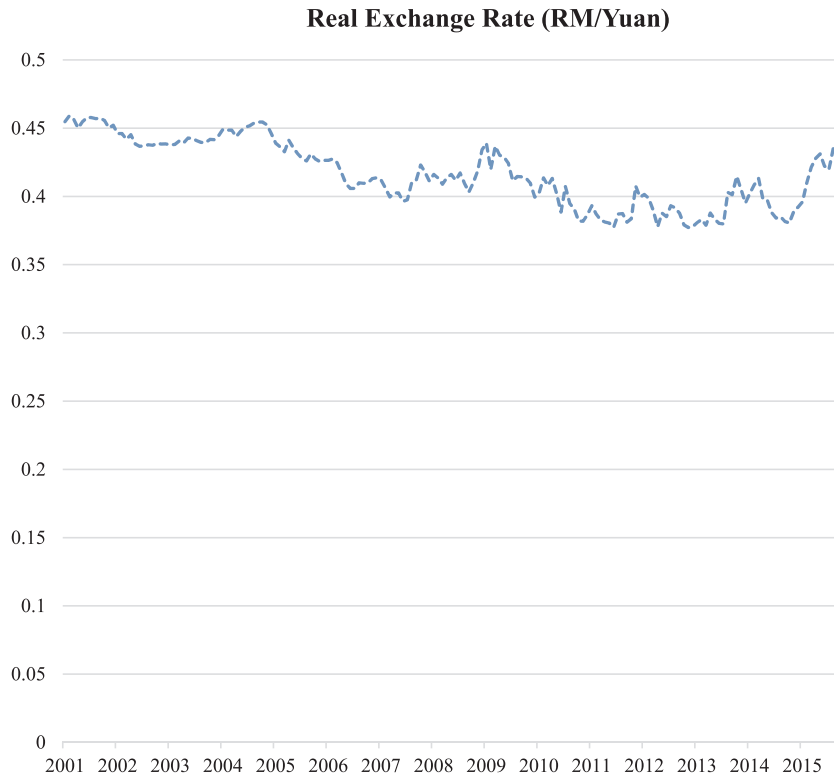


Fig. 1. Plot of the real exchange rate (#yuan per ringgit).

estimated the condition for 28 developed and developing countries, and Bahmani-Oskooee and Kara (2005), updated the estimate for the same 28 countries using a different method. Unfortunately, none of the studies included Malaysia, and even if they did, they would have considered trade between Malaysia and the world and not between Malaysia and China.¹

Today, a common practice to assess the effectiveness of exchange rate changes on the bilateral trade balance of a country is to rely upon a reduced form trade balance model that includes the real exchange rate in addition to scale variables as determinants of the trade balance. Indeed, Bahmani-Oskooee and Harvey (2010) relied upon this approach and estimated bilateral trade balance models between Malaysia and its 14 largest partners, including China. In the results with China, they found that ringgit depreciation has no significant long-run effects on the Malaysia-China trade balance. There are two deficiencies associated with this study. First, the lack of a significant link between the Malaysia-China trade balance and the real ringgit-yuan exchange rate could be due to aggregation bias. If the bilateral trade data are disaggregated by commodity, there will certainly be some commodities that could benefit from ringgit-yuan depreciation. Second, Bahmani-Oskooee and Harvey (2010) used Pesaran et al.'s (2001) linear ARDL bounds testing method, which assumes exchange rate changes to have symmetric effects on the trade balance. Thus, introducing nonlinear adjustments of the real exchange rate may have a different impact. In this paper we correct these two deficiencies and consider the trade balance of each of the 59 industries that trade between Malaysia and China by applying the nonlinear ARDL approach of Shin et al. (2014), which is an extension of the linear ARDL approach of Pesaran et al. (2001). To this end, we outline the models and review the two approaches in Section 2. In Section 3, we present our results, mostly supporting the nonlinear model and evidence of asymmetric effects of exchange rate changes. Finally, Section 4 concludes, while data definitions and sources are cited in the Appendix.

2. Linear and nonlinear trade balance models and methods²

Rose and Yellen (1989) developed a theoretical partial equilibrium model that identified the level of economic activity in two trading partners and the real bilateral exchange rate to be the main determinants of the bilateral trade balance. Indeed, Bahmani-

¹ For a review article on the Marshall-Lerner condition, see Bahmani-Oskooee et al. (2013). Note that Lal and Lowinger (2002), Duasa (2007) and Yusoff (2007, 2010) have estimated the aggregate trade balance of Malaysia with the rest of the world and found no significant link between the exchange rate and Malaysia's trade balance. This may be an indication of a violation of the Marshall-Lerner condition.

² The method in this section closely follows Bahmani-Oskooee and Fariditavana (2016), who raised the asymmetry concern against Rose and Yellen (1989). Both studies relied on the aggregate bilateral trade balance model.

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