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US–Thailand trade at the commodity level and the role of the real exchange rate

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ABSTRACT

Previous studies that have investigated the impact of real depreciation of the Thai baht on Thailand's trade flows have either used aggregate trade data between Thailand and the rest of the world, or between Thailand and its major trading partners. These studies have provided mixed results. In this paper, we disaggregate the trade flows between Thailand and its major trading partner, the US, by commodity and investigate the impact of currency depreciation on the export earnings of 118 American exporting industries and the outpayments of 42 American importing industries. While most industries are affected in the short run, the short-run results last into the long run in several small industries. The inpayments of large exporting industries and the outpayments of large importing industries are not affected. Economic activity seems to be the major long-run determinant of the performance of most industries.

1. Introduction

Historically, countries have relied upon three types of macroeconomic policy to manage their internal and external problems. The first two, fiscal and monetary policy, are often used to manage internal problems (to fight recession or lower inflation). The third, currency devaluation, is used to manage external problems: to reduce current account or trade deficits. Countries devalue their currencies or allow them to depreciation with the expectation that this will make their exports cheaper and imports expensive, leading to an improvement in their trade balance. Due to methodological advances in econometrics, almost every country seems to have its own literature regarding this third type of policy. In this paper, we examine Thailand's trade. As our literature review shows, this paper is able to make an important contribution to the field.

Traditionally, devaluation is said to improve the trade balance if sum of the import and export demand price elasticities exceeds unity, satisfying the so-called Marshall-Lerner condition. The first comprehensive study that estimated these elasticities is that of Houthakker and Magee (1969) which did include several developing countries (but not Thailand). Bahmani-Oskooee (1986), however, did include Thailand in his analysis of a set of developing countries. His estimates revealed that the Marshall-Lerner condition was not satisfied, implying that devaluation of the baht could not improve Thailand's trade balance in the long run. Given current evidence on the role of unit roots in time-series data, the estimates of these mentioned studies should be viewed with caution.

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Since the introduction of cointegration analysis in 1987, a few studies have revisited the Marshall-Lerner condition. Bahmani-Oskooee and Niroomand (1998) employed Johansen's cointegration technique, and Bahmani-Oskooee and Kara (2005) used the bounds testing approach of Pesaran, Shin, and Smith (2001). Both studies provided estimates of the Marshall-Lerner condition for more than 30 countries, but paid no attention to Thailand.

The Marshall-Lerner condition is actually said to be an indirect way of assessing the effectiveness of devaluation. More recent studies try to relate a measure of the trade balance directly to the exchange rate and estimate a trade balance model. Such models are used not only to assess the short-run effects (i.e., the J-Curve phenomenon), but also the long-run effects. Bahmani-Oskooee (1985, 1989), who introduced one such model, did include Thailand in his analysis. His estimates revealed that a real devaluation of the baht has short-run as well as long-run positive impacts on Thailand's trade balance with the rest of the world. Again, since Bahmani-Oskooee did not account for non-stationarity properties of the data involved, his results could be considered spurious. Indeed, Bahmani-Oskooee (1991) and Bahmani-Oskooee and Alse (1994) tested for the existence of unit roots in many developing countries' data. They showed that in the case of Thailand, while its trade balance data is non-stationary, its real effective exchange rate is stationary. Hence, Thailand was excluded from their long run analysis. Considering a different study period, Upadhyaya and Dhakal (1997) show that both variables in Thailand are integrated of order two, or second-difference stationary. Their long-run estimates reveal that "In Colombia and Thailand the long-run impact of devaluation on the trade balance is insignificant".[2] This finding is supported by Lal and Lowinger (2002) who used the Johansen cointegration technique.

All the studies reviewed above have used trade data between Thailand and rest of the world. Hence, they do suffer from aggregation bias. Following Rose and Yellen (1989), subsequent studies have disaggregated their trade data and have estimated Thailand's trade balance model at the bilateral level. While Baharumshah (2001) estimated a bilateral trade balance model between Thailand and the US in one relation and between Thailand and Japan in another relation, Bahmani-Oskooee and Kantipong (2001) added Germany, Singapore, and the U.K. to the list of partners. Both studies concluded that devaluation of the Thai baht could improve Thailand's trade balance with the US and with Japan. These results do not change when Onafowora (2003) accounts for 1997 financial crisis in East Asia by including a dummy variable in the model.

As the above review reveals, the findings are mixed and they depend on the aggregation level and Thailand's trading partners. In this paper we concentrate on the trade flows between Thailand and its major trading partner, the US, and disaggregate the trade flows by commodity. Continuous time-series data over the period 1971–2006 were available for 118 industries that export from US to Thailand and for 42 industries that import from Thailand to the United States. Disaggregation by commodity is our main focus and the main contribution that goes beyond and above existing literature. Unfortunately, since these exporting and importing industries do not match, neither in numbers nor in name and content, we cannot estimate a trade balance model for each industry. An alternative approach in the literature is to assess the impact of currency depreciation on each export and import industry separately. For that purpose, the models and the methods are introduced in Section 2. Section 3 presents empirical results that most industries are affected by currency depreciation in the short-run but not in the long run. Section 4 provides a summary. Data definitions and sources are cited in an Appendix A.

2. The models and the method

In an effort to understand the logic behind using the models introduced in this section, we define the trade balance for each industry j by Eq. (1):

$$TB_J = P_J^X X_J - P_J^M M_J \tag{1}$$

where TB_J is the trade balance of industry j; P_J^X and P_J^M are export and import prices, respectively; and X_J and M_J are export and import volumes. Thus, the trade balance of industry j is defined as the difference between the export value, or inpayments, of industry j and the import value, or outpayments, by industry j. The Marshall-Lerner condition, which is derived from (1), is based on the sensitivity of X_J to P_J^X and M_J to P_J^M. Since prices at the commodity level are not available, a common practice is to relate inpayments and outpayments of each industry to the exchange rate in addition to some scale variables. Such models at commodity level have already been used by Bahmani-Oskooee and Ardalani (2006), who disaggregated US trade flows by commodity and investigated sensitivity of the inpayments and outpayments of 66 American industries which traded with the rest of the world. Thus, the exchange rate included in their models was the real effective exchange rate of the dollar. Since our models are to be estimated only between the US and Thailand, we modify their specifications and include the real bilateral exchange rate in our models as in Eqs. (2) and (3):

$$LnVX_{J,t}^{US} = a + bLnY_{TH,t} + cLnRE_t + \varepsilon_t \tag{2}$$

$$LnVM_{J,t}^{US} = d + eLnY_{US,t} + fLnRE_t + \mu_t \tag{3}$$

Since the commodity level trade data are reported by the US, for ease of exposure we specify the models from the US perspective. As such, in (2) VX_J is the dollar value of the jth industry's exports from US to Thailand (or Thailand's imports from

[2] See page 345.