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## Effect of Real Exchange Rate on Trade Balance: Commodity Level

### Evidence from Turkish Bilateral Trade Data<sup>1</sup>

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#### Abstract

An initial currency depreciation/devaluation is expected to worsen the trade balance in short run, before leading to an improvement in the long run. Given the persistent nature of its current account deficits and large oscillations in Turkish Lira, prospective effects of exchange rate policy prescriptions raise academic interest in Turkish economy. This paper aims to investigate the links between the real exchange rate and the balance of trade. By employing cointegration technique and error correction modelling between Turkey and her major trading partner Germany, presence of J- Curve phenomenon is tested on a monthly basis over the period 2002 to 2014. We employed disaggregate data on commodity level. Use of disaggregated bilateral trade data avoids any aggregation bias. Furthermore, disaggregation at commodity level permits to weigh the effect of changes in real exchange rate on the individual industry trade balance. Empirical results provide some support for the existence of j-curve effect. Nevertheless, no single pattern of exchange rate - trade balance relationship is found to exist.

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## 1. Introduction

The way exchange rates affect the balance of trade, and the current account, has been an issue of fundamental importance for both the academics and the policymakers. Economic theory suggests a real devaluation to improve trade balance, as long as Marshall - Lerner condition is satisfied. However, adverse effects of 1967 British and 1971 U.S. devaluations galvanized academic interest in cases under which ML condition is fulfilled yet the trade balance continued to deteriorate. Persistence of trade deficit against currency depreciation invoked j-curve phenomenon as an explanation. The phenomenon is characterized by an initial unfavorable effect of a real currency depreciation on trade balance before leading to an improvement (i.e. effect resembles the letter J, thus called J curve effect).

The impact of a currency depreciation on trade balance is explained in terms of price and volume effects. Provided that ML condition is satisfied, a currency depreciation is meant to increase (decrease) the price of imports (exports), thus expected to decrease (increase) the quantity of exports (imports) leading to a favorable impact on trade balance. Magee (1973) was first to distinguish short run effects of exchange rate depreciation from its long run effects. Both prices and quantities, by and large, are subject to substantial adjustment lags in the short run (Junz and Rhomberg, 1973). Since goods contracted at pre-depreciation (old) prices and are already in transit, prices remain sticky in the short run (currency contract period). The transmission of exchange rate changes to the prices of internationally traded goods depend on the extent to which exchange rates pass - through. Finally, quantity adjustment period follows the currency - contract and pass - through periods. Depending on resilience of trade balances, the net effect on trade balance may be unfavorable. Over the longer run, when new contracts are signed, relative prices change, volume of exports increase (imports decrease) and the trade balance improves.

Since its introduction by Magee (1973), there have been numerous studies testing the short - run and long - run relationships between the real exchange rate and the balance of trade. Some of these studies tested the j-curve phenomenon on cross-country data, while others focused on individual country data. A very comprehensive literature survey on J-curve phenomenon has been provided by Bahmani-Oskooee and Ratha (2004). The earlier literature has estimated trade elasticities using OLS and 2SLS methods of estimation. However, it has been revealed that due to non-stationary macro data contained in these models, inferences suffered from spurious regression problem. Since the introduction of co-integration techniques to account for integrating properties of the variables, researchers have employed these models to examine the long - run relationship between bilateral trade balance and the real exchange rate. Results from the empirical J-curve literature have been largely inconclusive. Rose (1991), Bahmani- Oskooee and Alse (1994), Demirden and Pastine (1995) for instance, found no evidence for J-curve while Mahdavi and Sohrabian (1993) found some evidence for a delayed j-curve phenomenon. Rose and Yellen (1989) argued that a country's trade balance could be improving with one trading partner and at the same time deteriorating with another one. Hence, use of aggregate data might suppress actual movements taking place at the bilateral levels. Following Rose and Yellen (1989) a new strand of literature began to investigate the j-curve based on bilateral data to avoid aggregation bias. They did not find any supportive evidence in favour of j-curve. The inconclusive nature of the empirical literature did not change. Among this group of studies, Bahmani-Oskooee and Brooks (1999), Wilson (2001), Baharumshah (2001) found no evidence for the J-curve while Marwah and Klein (1996), Shirvani and Wilbratte (1997), Gupta-Kapoor and Ramakrishnan (1999), Bahmani-Oskooee and Goswami (2003), Arora et.al. (2003) confirmed the J-curve effect. Yet, these studies may still be subject to aggregation bias in the sense that countries trade various commodities which may have differing elasticities of export and import (Bahmani-Oskooee, Ardalani, 2006). Therefore, a growing body of recent studies further disaggregated the trade data to industry level (Bahmani-Oskooee, Kovryalova, 2008; Bahmani-Oskooee, Hegerty, 2011; Bahmani-Oskooee, et.al., 2014).

Given the persistent nature of its current account deficits and large oscillations in Turkish Lira, prospective effects of exchange rate policy prescriptions hold high importance for Turkish economy. Nevertheless, existing empirical literature on the relationship between the real exchange rate and trade balance for Turkey are very few, and largely based on aggregate data. Rose (1990), Bahmani-Oskooee, Malixi (1992), Bahmani-Oskooee and Kutan (2009) investigated the j-curve phenomenon in cross-country setting and found no positive evidence for the case of Turkey. In a similar cross-country setting, Bahmani-Oskooee and Alse (1994) found that devaluations have favourable impact on trade balance in the long run. Kale (2001), and Akbostanci (2004) tested the J-curve phenomenon for Turkish economy based on aggregate data, and they also found some positive effects for long run. Recently, Halicioğlu (2008) tested bilateral j-curve with respect to 13 trading partners, and found no support for the j-curve phenomenon in the short run. However, he found that in the long run the real depreciation of TL has led to an improvement in Turkey's trade balance with UK

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