Real Exchange Rate Decomposition: An Alternative Solution to the Armington Elasticity Puzzle

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Abstract:

The elasticity of substitution among domestic and foreign goods is labeled as the Armington elasticity. Armington elasticity measures the reaction of the relative demand of heterogeneous domestic and foreign products to a change in their relative prices. This elasticity is an important determinant of bilateral trade flows and relative international prices. The size of this elasticity parameter has important implications for many international economics and international macro models. However, the literature has not reached a consensus on what the value of the Armington elasticity is, leading to the Armington elasticity puzzle. The puzzle is reflected in the different Armington elasticity assumptions necessitated by the macro and micro models, to ensure that the models provide realistic outcomes. The overall goal of this study is to contribute to the literature by providing a detailed empirical analysis of the Armington elasticity. The first aim of the study is to provide evidence that the bilateral trade flows are correlated with the temporary and permanent components of the real exchange rate. The study further tests three more hypotheses. The first of these is that not only do the bilateral trade flows, but so do the extensive and intensive margins of trade respond differentially to the permanent and temporary components of the real exchange rate. Secondly, the study tests whether these responses differ across product groups classified according to their substitutability nature. Finally, the exercise is repeated for bilateral trade across HS 2-digit sectoral classifications. A Gravity Model is estimated for 1995-2014 period and 145 countries using sectoral level bilateral data to provide support for the above hypotheses. The main conclusions of the study are summarized as follows: first of all, the importance of differentiating the permanent and temporary components of the real exchange rate changes is illustrated with significant and negative coefficients for permanent and insignificant coefficients for temporary real exchange rate changes in determining bilateral export amounts. Similar effects are also identified in the estimation of the determinants of extensive and intensive margins of trade, with highly significant effects of the permanent component of real exchange rates on exports defined as extensive margins. The same results are more pronounced when trade amounts are grouped according to the degree of substitutability, where the impact of the components of real exchange rates on the extensive

margin of trade are found to be different across sectors. The final outcome of the study proves that the decomposition of real exchange rate into permanent and temporary components are also important in estimation of the Armington elasticities for individual sectors. Hence, this provides further support for the caution against working with highly aggregated data in trade elasticity estimations.

Keywords: Real Exchange Rate, Armington Elasticity, Extensive Margin, Intensive Margin

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