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May 2022

Online at <https://mpra.ub.uni-muenchen.de/113194/>
MPRA Paper No. 113194, posted 30 May 2022 11:10 UTC

The Problem of Measuring Intra-industry Trade

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Abstract

From a historical perspective, the development of research studies concerning the emergence of intra-industry trade is fruitful interaction between theoretical explanations and empirical methods to measure this phenomenon. The foundation of indicators to measure the intensity of intra-industry trading caused the rise of theoretical models explaining the determinants of these trade flows. It also contributed to the debate on the need to distinguish, in empirical analyses, intra-industry trade in horizontal differentiation from that in vertical differentiation.

Keywords: Intra-Industry Trade, Horizontal Differentiation, Vertical Differentiation

1 Introduction

Starting from the end of 1960s, the problem of measuring intra-industry trade lies at the very origin of the literature on intra-industry trade. A series of empirical works describe the intensive & extensive existence of this phenomenon through statistical indicators. Indeed, [Greenaway and Milner \(2003\)](#) asserts that the entire literature started with statistical measurement. Among the foundational works on intra-industry trade, the articles of [Balassa \(1965, 1966\)](#) and the book of [Grubel and Lloyd \(1975\)](#) are especially notable. Because the indicators developed by these authors have acquired a seminal status in the empirical analysis of international trade, these works preceded and triggered the development of different theoretical explanations of intra-industry trade.

The theoretical analyses of intra-industry trade explore the phenomenon by adopting disparate assumptions about the nature of returns to scale, the typology of markets, and the differentiation of products subject to this type of trade. [Krugman \(1979\)](#), [Lancaster \(1980\)](#) and [Helpman \(1981\)](#) explain the rise intra-industry trade in horizontally differentiated products within a framework of monopolistic competition. [Falvey \(1981\)](#) and [Shaked and Sutton \(1984\)](#) respectively study the trade of vertically differentiated products in the context of perfectly competitive and oligopolistic markets. Meanwhile, [Brander \(1981\)](#) models the intra-industry exchange of perfectly homogeneous (and therefore undifferentiated) goods in an oligopolistic market context.

2 Analyses

The determinants of intra-industry trade highlighted by these theoretical works are different and depend, in particular, on the type of differentiation taken into account in the various analyses. In monopolistic competition models of [Krugman \(1979\)](#), [Lancaster \(1980\)](#), and [Helpman \(1981\)](#), a necessary condition for the development of intra-industry trade in horizontal differentiation is the existence of economies scale in the production of different varieties. On the other hand, [Falvey \(1981\)](#) explains intra-industry trade in a vertical differentiation setting by the difference between the relative factor endowments of countries, where the production of all goods is in the assumption of constant returns to scale. The prediction of [Falvey \(1981\)](#) model depends crucially on the following assumption. The production of higher quality differentiated goods requires a greater amount of capital per unit of labour than the production of relatively low-quality ones. However, in the case of measuring intra-industry trade using very disaggregated product classifications,

the assumption about the products in that same level of disaggregation having different factorial contents is debatable. In fact, [Vona \(1990, 1991\)](#) indicate the similarity between factor contents of products belonging to the same statistical category is very high at the disaggregated product detail levels of international classifications.

The theoretical analyzes developed during the 1980s help to strengthen the impression that intra-industry trade is a complex phenomenon and multifaceted. Indeed, the Chamberlin-Heckscher-Ohlin (C-H-O) model proposed by [Helpman and Krugman \(1987\)](#) explains the simultaneous growth of intra-industry trade (in horizontal differentiation) and inter-industry trade between countries. In this framework of economies of scale in the production of differentiated goods, intra-industry trade is the most important if the endowment of relative factors of production of the countries are similar, while the share of inter-industry trade is an increasing function of the difference between these endowments.

The determinants of intra-industry trade highlighted by [Falvey \(1981\)](#) and [Helpman and Krugman \(1987\)](#) are not only different, but also irreconcilable. Indeed, [Falvey \(1981\)](#) predicts a positive relationship between the difference in factor endowments among countries and the rise of intra-industry trade (in vertical differentiation), while the authors [Helpman and Krugman \(1987\)](#) show a negative relationship between the difference in factor endowments and the development of intra-industry exchanges (in horizontal differentiation). At the same time, the econometric analyses of intra-industry trade were carried out during the 1980s. The works of [Balassa and Bauwens \(1987\)](#) and [Helpman \(1987\)](#) do not lead to conclusive results of the sign of the existing relationship between the similarity of the factor endowments of trading partners and the share of intra-branch trade in bilateral trade (measured by the index of [Grubel and Lloyd \(1975\)](#)). [Greenaway and Torstensson \(1997\)](#) express very clearly the lesson that can be drawn from this first wave of econometric analyzes aimed at testing intra-industry trade theories:

”... the determinants for vertical and horizontal intra-industry trade seem to differ. This may explain why when using total intra-industry trade as the dependent variable different econometric results have led to different conclusions. In other words, if the dependent variable in a regression is heterogeneous, it is not surprising that the coefficient for the explanatory variables is somewhat unstable.”

In other words, econometric models including an intra-industry trade index total (without distinction between horizontal and vertical differentiation) as an explained variable are probably poorly specified insofar as the theoretical analysis

highlighted different determinants for these two types of trade. Moreover, the theoretical models of [Falvey \(1981\)](#) & [Helpman and Krugman \(1987\)](#) suggest that the consequences of these two types of intra-industry trade are very different. In particular, adjustment costs (linked to the reallocation of resources from the importing to exporting sectors) generated by the exchanges of vertically differentiated products are greater than those generated through trade in horizontally differentiated products.

3 Conclusion

All these reasons give rise to the conviction that intra-industry trade in horizontal and vertical differentiation constitute two distinct phenomena, both in terms of determinants and consequences. From the end of the 1980s, this conviction is at the origin of developing methods and statistical indicators to separately measure the extent and evolution of these two types of trade. Thus, the development of research programs concerning intra-industry trade has been a fruitful interaction between theoretical analyses and empirical methods of measuring the importance of this phenomenon. Development of indicators to measure intra-industry trade preceded and triggered the rise of first theoretical explanations of this phenomenon. These in turn, have contributed to reviving the empirical debate on the measurement of intra-industry trade by suggesting the need to distinguish, in empirical analyses, intra-industry trade in vertical differentiation from that in horizontal one ([Balboni, 2007](#)).

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