

**The Development and  
Testing of Heckscher-  
Ohlin Trade Models:**

A Review

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## Preface

At the time I presented my Ohlin lectures in October 1993, the multi-factor, multi-good version of Heckscher-Ohlin trade theory (the Heckscher-Ohlin-Vanek model) was the dominant theoretical model of international trade. However, early empirical testing of the model based on multi-country, multi-factor data had yielded disappointing results. Thus, in addition to reviewing briefly both the theoretical development of this and related models and the results from these and other empirical tests, I discussed how modifying various assumptions of the model might yield a more complex but empirically satisfactory framework for understanding patterns of international trade. In particular, I emphasized an objective stressed by Ohlin, namely the need to formulate a dynamic model that integrated trade and development theory.

Empirical tests later in the 1990s strengthened the earlier conclusions about the shortcomings of the Heckscher-Ohlin-Vanek model. Trefler (1995) demonstrated that the volume of countries' trade predicted by this model was an order of magnitude greater than their measured trade and that the proportion of sign matches between predicted and measured trade in productive factors was no better than

about 50 percent. While he showed that introducing Hicks-neutral technological differences among countries greatly improves the fit between predicted and measured trade, the basic Heckscher-Ohlin proposition concerning the importance of relative factor endowments still did not receive strong empirical support.

Fortunately, research in the late 1990s and early part of this decade by Davis and Weinstein (2001a) led to the formulation of a trade model that not only is strongly supported empirically but in which relative factor endowments play a major role. As explained in the text, the key was dropping the assumption of factor price equalization and permitting multiple cones of factor diversification in addition to introducing Hicks-neutral difference in technology among countries.

It struck me at the time that the contributions of these authors provided an appropriate occasion to review in greater detail the development and testing of Heckscher-Ohlin models since the publication of Ohlin's monograph in 1933. Consequently, with the encouragement of Elizabeth Murry, The MIT Press editor then handling the books based on authors' Ohlin lectures, I decided to revise and expand significantly the paper on which my lectures were based. The process has taken far longer than I expected, but it has been very satisfying personally to try put the various twists and turns that Heckscher-Ohlin trade theory and empirical testing has taken over the years into an understandable framework that shows how progress in this area of trade gradually took place. Unfortunately, now that I am retired, I have not had the opportunity to run the text by graduate students taking my course in international trade, who invariably are able to point out important omissions and

errors in one's writings no matter how many times that the author has reviewed the text himself.

I am greatly indebted to two anonymous readers for The MIT Press who provided numerous valuable suggestions for improving the review. Mina Kim also provided valuable assistance in drawing the figures and in checking the text for grammar and typos.

In using a uniform notation in the various equations, I have mainly followed the style adopted by Rob Feenstra in his excellent graduate text in international trade.

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