

**International Trade:
Selected Readings**

edited by
Jagdish N. Bhagwati

second edition

The MIT Press
Cambridge, Massachusetts
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Editor's Preface

This is the second edition of the earlier set of *Readings* which I had assembled for use in courses on the theory of international trade. Although they had been designed for use primarily with the text by Professor T. N. Srinivasan and myself, *Lectures on International Trade* (MIT Press), they were usable by themselves and were indeed widely used as such.

The original edition was first published in 1981. It went through four reprintings. But by 1986 the first edition was seriously out of date. Two fundamental revolutions had overtaken the field: (1) the theory of imperfect competition, both the large-group case and the small-group “market structure” analysis, had grown exponentially, and (2) the theory of directly unproductive profit-seeking (DUP) and rent-seeking activities had equally expanded dramatically, overwhelming the preoccupations of many theorists of trade and welfare. While the former amounted to outfitting the traditional bicycle with an innovative new motor that outdazzled the older model, the latter amounted to taking the old bicycle down a new road.

The new *Readings* therefore now include four papers in part III on the developments in the theory of imperfect competition and market structure and two papers in part IX on correspondingly new models of multinational direct investment. Equally, they include three papers in part VI on the theory of DUP and rent-seeking activities.

Altogether, twelve papers from the first edition have been dropped, whereas thirteen new papers have been added. In view of the considerable recent revival in interest in two time-honored topics in the theory of international trade, comparative advantage and the transfer problem, three papers on these subjects have been added to the new selection. Ed Leamer's influential work on comparative advantage in the tradition of the factor-content approach of Jaroslav Vanek has now been treated at book-length at MIT Press by him, but the selection here reprints his early, classic paper on the problem in the *Journal of Political Economy*. The renewed interest

in the transfer problem has come independently and with explosive force and significant impact in mathematical economics and in international economics. Hence I have reprinted part of Harry Johnson's splendid treatment of the classic Samuelson-initiated analysis of the problem in the two-good, two-country framework, while also including the Bhagwati-Brecher-Hatta generalization of it to the three-country framework. The latter paper has the advantage that it reviews equally other independent contributions in this area, while uniquely managing to integrate the analysis into the general theory of distortions and welfare.

Therefore, although the new selection should bring the student to the edge of all the major new developments in international trade analysis of the last decade, this gain has come at the expense of my having had to drop some excellent papers. This was a hard thing to do, especially as I had to contradict my own sense of what was considered worth including in the first edition! In wielding the axe, I have drawn on the advice of many former students and present colleagues at different universities, going by their experience with trade students over the last few years. Nevertheless, the loss of these earlier papers illustrates anew why economics is important: scarcity is a fact of life.

I must thank David Laster for substantial help with putting the new selection together. He is a splendid student, who was on top of the entire subject and helpful with ideas and suggestions that proved extremely perceptive. I have also benefited from the advice of other students, especially Sunil Gulati and Doug Irwin, and from several economists in the field: Avinash Dixit, Elhanan Helpman, Alan Deardorff, Ronald Findlay, Gene Grossman, Robert Feenstra, Richard Brecher, T. N. Srinivasan, Elias Dinopoulos, Oded Galor, and Kar-ylu Wong. Brian Wesol helped greatly with the proofreading.

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I

General Equilibrium

Introduction to Part I

Part I contains five papers on general equilibrium theory and tools. Chapter 1 is Paul Samuelson's classic paper on factor price equalization, which, with its earlier companion paper on the same subject (*Economic Journal*, June 1948), laid the foundation of the modern theory of international trade by casting the Heckscher-Ohlin ideas into a well-defined analytical model. Its precise subject of factor price equalization in this model, now called the Heckscher-Ohlin-Samuelson model, has led to a great body of work on the precise conditions under which factor price equalization will follow from goods-price equalization under free trade, with extensions to the many factors and many goods models by McKenzie, Gale, Nikaido, and others.

Chapter 2, however, which consists of a classic paper by Robert Mundell, turns the problem around and asks whether factor price equalization in a world of international mobility of one of the factors will restore goods price equalization when a tariff has destroyed the goods price equalization directly, and it demonstrates elegantly that indeed the factor price equalization theorem can be turned on its head.

Chapter 3 is a brilliant exploration of the related problem as to whether trade in goods and international factor mobility are substitutes or components. Kar-yin Wong builds on the important work of Samuelson, Mundell, Markusen, and Svernnson, distinguishing among alternative definitions of substitution and complementarity, to establish necessary and sufficient conditions under which either outcome will emerge.

Chapter 4 is a beautiful piece by Michael Mussa, which may be viewed as a geometric companion piece to the Samuelson paper insofar as it develops the geometry of the 2×2 model in terms of its dual, thus adding to our pedagogic repertoire. This geometry is particularly helpful in analyzing factor market distortions, and it should be of considerable value insofar as the use of duality theory has become more popular in trade theory as it has in the theory of public finance and elsewhere.

Chapter 5 is an excerpt from a long, important paper by Peter Neary on the analytics of the specific factors model of Ricardo and Viner, independently revived by Paul Samuelson and Ronald Jones. The model has been earlier explored by Michael Mussa and by Wolfgang Mayer, but its properties are more fully dealt with in the Neary paper. The popularity of this model in some of the analytical work on endogenous tariff and foreign investment modeling has made it worth adding to the average student's analytical repertoire.

My recent paper attempting to show that free commodity trade will, under certain specified conditions, inevitably lead to complete factor-price equalisation appears to be in need of further amplification.¹ I propose therefore (1) to restate the principal theorem, (2) to expand upon its intuitive demonstration, (3) to settle the matter definitively by a brief but rigorous mathematical demonstration, (4) to make a few extensions to the case of many commodities and factors, and finally (5) to comment briefly upon some realistic qualifications to its simplified assumptions.

I cannot pretend to present a balanced appraisal of the bearing of this analysis upon interpreting the actual world, because my own mind is not made up on this question: on the one hand, I think it would be folly to come to any startling conclusions on the basis of so simplified a model and such abstract reasoning; but on the other hand, strong simple cases often point the way to an element of truth present in a complex situation. Still, at the least, we ought to be clear in our deductive reasoning; and the elucidation of this side of the problem plus the qualifying discussion may contribute towards an ultimate appraisal of the theorem's realism and relevance.

1. Statement of the Theorem

My hypotheses are as follows:

1. There are but two countries, America and Europe.
2. They produce but two commodities, food and clothing.
3. Each commodity is produced with two factors of production, land and labour. The production functions of each commodity show "constant returns to scale," in the sense that changing all inputs in the same proportion

This paper was originally published in *The Economic Journal* (June 1949): 181–197.

changes output in that same proportion, leaving all “productivities” essentially unchanged. In short, all production functions are mathematically “homogeneous of the first order” and subject to Euler’s theorem.

4. The law of diminishing marginal productivity holds: as any one input is increased relative to other inputs, its marginal productivity diminishes.

5. The commodities differ in their “labour and land intensities.” Thus, food is relatively “land using” or “land intensive,” while clothing is relatively “labour intensive.” This means that whatever the prevailing ratio of wages to rents, the optimal proportion of labour to land is greater in clothing than in food.

6. Land and labour are assumed to be qualitatively identical inputs in the two countries, and the technological production functions are assumed to be the same in the two countries.

7. All commodities move perfectly freely in international trade, without encountering tariffs or transport costs, and with competition effectively equalising the market price-ratio of food and clothing. No factors of production can move between the countries.

8. Something is being produced in both countries of both commodities with both factors of production. Each country may have moved in the direction of specialising on the commodity for which it has a comparative advantage, but it has not moved so far as to be specialising completely on one commodity.²

All of this constitutes the hypothesis of the theorem. The conclusion states:

Under these conditions, real factor prices must be exactly the same in both countries (and indeed the proportion of inputs used in food production in America must equal that in Europe, and similarly for clothing production).

Our problem is from now on a purely logical one. Is “If H , then inevitably C ” a correct statement? The issue is not whether C (factor-price equalisation) will actually hold; nor even whether H (the hypothesis) is a valid empirical generalisation. It is whether C can fail to be true when H is assumed true. Being a logical question, it admits of only one answer: either the theorem is true or it is false.

One may wonder why such a definite problem could have given rise to misunderstanding. The answer perhaps lies in the fact that even so simple a setup as this one involves more than a dozen economic variables: at least four inputs for each country, four marginal productivities for each country (marginal productivity of American labour in food, of American land in food ...), two outputs for each country, the prices of the two commodities, the price in each country of the two inputs, the proportions of the inputs

in different lines of production, and so forth. It is not always easy for the intellect to move purposefully in a hyperspace of many dimensions.

And the problem is made worse by the fact, insufficiently realised, that constant returns to scale is a very serious limitation on the production functions. As soon as one knows a single "curve" on such a surface, all other magnitudes are frozen into exact quantitative shapes and cannot be chosen at will. Thus, if one knows the returns of total product to labour working on one acre of land, then one already knows everything: the marginal productivity schedule of land, all the iso-product curves, the marginal-rate-of-substitution schedules, and so forth. This means one must use a carefully graduated ruler in drawing the different economic functions, making sure that they are numerically consistent in addition to their having plausible qualitative shapes.

2. Intuitive Proof

In each country there is assumed to be given totals of labour and land. If all resources are devoted to clothing, we get a certain maximum amount of clothing. If all are devoted to food production, we get a certain maximum amount of food. But what will happen if we are willing to devote only part of all land and part of total labour to the production of food, the rest being used in clothing production? Obviously, then we are in effect sacrificing some food in order to get some clothing. The iron law of scarcity tells us that we cannot have all we want of both goods but must ultimately give up something of one good in getting some of another.

In short there is a best "production possibility," or "transformation" curve showing us the maximum obtainable amount of one commodity for each amount of the other. Such a production possibility schedule was drawn up for each country in figure 1.1 of my earlier article. And in each

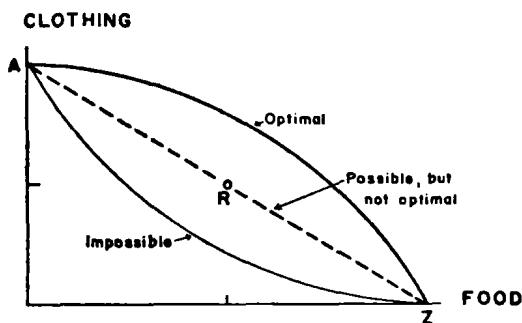


Figure 1.1