The Theory of international trade: back to basics

Reinaldo Gonçalves
Professor of International Economics, Federal University of Rio de Janeiro.

Introduction

The purpose of this text is to present an overview of the different theories of international trade.[2] International trade has developed to the extent that it is no more possible to deal with the issues in a single paper. Among these issues one can single: the "pure" theory of international trade; imperfect competition and international trade; testing trade theory; the theory of protection; the political economy of trade policy; strategic trade policies; trade, growth and development; international economic integration; services trade; international trade and international production; multilateral trade negotiations; and international trade and open-economy macroeconomics.

Indeed, each one of these issues implies a specific field of study.[3] Here, it is not the objective to carry out an extensive survey of the literature on the theory of international trade and its applications. The paper aims at presenting a bird's eye view of the pure theory of international trade, which tackles the basic determinants of foreign exchange. It is a limited survey insofar as its main purpose is to help students and practitioners, who are faced with textbooks, books and papers which fail to show the hardcore of the international trade theory, a highly complex subject.

To illustrate, not only has there been an exaggeration on the importance (and novelty) of the most recent models which deal with scale economies and imperfect competition, but the analysts and practitioners have also tended to overrate the influence of specific variables, such as, technology. In this regard, it seems to be more appropriate to talk about "new models" rather than a "new theory" of international trade.

The development of economic thought with respect to international trade cannot be summarized here. At this point it suffices to say that, at the risk of some oversimplification, the recent developments and elaborations can be conveniently classified into the following groups: neo-factor theories, neo-technology theories, scale economy, market structure and demand influences. Indeed, in the text we are only going to make reference to the main pioneer studies within each group of theory. For a fuller discussion and for references to the literature, the reader is referred to the works mentioned in the footnotes and in the Appendix.

Moreover, one can say that the basic argument underlying this survey is that there is no general theory of international trade, as Jacob Viner argued almost fifty years ago. As a matter of fact, given the growing complexity of the issues and the influence of heterogeneous variables, it is not possible to have a single and general theory of international trade. Of foremost importance is to keep a balance in terms of the relative importance of the different determinants of international trade.

The principle of comparative advantage

Most theorising on international trade deals with the basic determinants of the commodity patterns and welfare implications of trade. Mainstream theories of international trade are mostly based on the principle of comparative advantage, that is, the international exchange of goods is the result of intercountry differences in relative or comparative costs and, therefore, in relative prices.

The principle of comparative advantage implies a certain emphasis on supply-side determinants of exchange. Nevertheless, the role of demand was recognized by the English classical school insofar as demand-side factors are particularly important to determine the relative prices. Models of international trade which depart from the principle of comparative advantage and deal with demand influences more directly are discussed in this paper.

As a general principle, any given country will tend to export products in which it has a comparative advantage and to import products in which it has a

comparative disadvantage. The basic theoretical issue is, then, to explain the basic determinants of the intercountry differences in comparative costs.

The Ricardian theory or the calssical model

At the origin of the principle of comparative advantage is the Ricardian model of international trade based on the classical labour theory of value. According to this model, comparative costs are determined by relative labour productivity. Intercountry variations in labour productivity would stem mostly from international technological differences.

Ricardo's analysis starts as a critique of Adam Smith's principle of absolute advantage, that is, international trade is determined by absolute differences in labour productivity. In his model, Ricardo assumes that production functions are different across countries and that they exhibit constant returns to scale. The classical model of international trade is probably best summarized by a footnote in Ricardo's main work :"It will appear then, that a country possessing very considerable advantages in machinery and skill, and which may therefore be enabled to manufacture commodities with much less labour than her neighbours, may, in return for such commodities, import a portion of the corn required for its consumption, even if its land were more fertile, and corn could be grown with less labour than in the country from which it was imported."[4]

A number of attempts have been made at testing the theory of international trade.[5] The best-known empirical test of the Ricardian model is that of G. MacDougall with respect to the U.S. and U.K. exports to third markets. According to his findings, there was a significant positive correlation between relative labour productivity and the relative export performance of the two countries. These findings provided evidence in support of the hypothesis indicated by the Ricardian model.[6] The independent variable in MacDougall's test was the ratio of U.S. output per worker to U.K. output per worker and his independent variable was the ratio of U.S. quantity of exports to U.K. quantity of exports to third markets. His sample included 25 groups of products and the data referred to 1937.[7]

One of the main criticisms raised against MacDougall's test of the Ricardian trade theory is that, by concentrating the analysis on labour productivity, one puts aside the influence of other factors of production. Intercountry efficiency differences are associated with variations in trade patterns, but these differences represent total factor productivity which depends on the interaction of labour with the other factors of production.

The Heckscher-Ohlin theory or the neoclassical model

One century after Ricardo established the principle of comparative advantage, Eli Heckscher combines the "prices of the agents of production" with international trade, following the tradition of the neoclassical school.[8] Here a quotation from Heckscher's seminal paper seems to be justified: "It must be stressed at this point that the term `factor of production' does not refer simply to the broad categories of land, capital, and labour, but to the different qualities of each of these. The number of factors of production is thus practically unlimited."

In this regard, the simplified version of the neoclassical theory which ends up in (2x2x2)-type models based on two factors, two goods and two countries, seems to be a major departure from the Heckscher's original conception of the determinants trade. As a matter of fact, the neo-factor theories of international trade go back to this original conception, as it is shown below.

By incorporating other factors of production (land, labour and capital) into his analysis, Heckscher extended the Ricardian model, in which relative prices reflected relative labour productivity. It is, however, the assumption of an international equality of technology that provides the basis for the main propositions of the neoclassical model of international trade (the Heckscher-Ohlin model).

Indeed, in his article Heckscher is mostly concerned with the relation between international trade and income distribution. In this regard, he discusses the hypothesis of equalization of relative prices of factors of production.[9] This hypothesis was developed further by Samuelson in the late 1940s and early 1950s.[10] Moreover, the Heckscher's model of international trade was reshaped by Ohlin in his doctoral thesis in 1924, which was published in English a few years later.[11] As a result, the neoclassical analysis of international trade became known as the Heckscher-Ohlin theory or the

Heckscher-Ohlin-Samuelson theory.

In the neoclassical model, the intercountry difference in factor endowments is the major determinant of comparative advantage. The differences in the relative scarcity of factors of production affect relative costs and, therefore, the commodity trade patterns. Thus, the basic neoclassical theorem of international trade is that a country tends to export goods which use relatively large amounts of its most abundant factors of production. Comparative advantage patterns are, then, determined by the relative scarcity of factors of production so that, for instance, capital-rich countries tend to export capital-intensive products.

As far as the empirical test of the Heckscher-Ohlin model is concerned, the best-known study is the one carried out by W. Leontief on the international exchange of the United States.[12] Leontief's analysis of the domestic capital and labour requirements of U.S. exports and of competitive import replacements was based on the 1947 input-output structure of the American economy and on a 200 industry breakdown. In this study, it was shown that U.S. exports embodied less capital per worker than U.S. import-competing goods, that is, in a capital-rich industrial country, exports were more labour intensive than imports. This finding, which contradicted the Heckscher-Ohlin model, became known as the "Leontief paradox".

The "Leontief paradox" stimulated the further development of theoretical studies and empirical analysis of international trade.[13]

The neo-factor theories

The neo-factor theories follow the Heckscher-Ohlin model in the sense that a country's comparative advantage is the result of international differences in factor endowments. The extension of this model take explicit account of the influence of natural resources and "human capital" as determinants of comparative advantage and international trade. The influence of inter-country differences in natural-resource endowments is particularly important to explain comparative advantage patterns in natural-resource intensive products.[14]

Empirical studies have also been concerned with the complementarity of natural resources with respect to the other factors of production. It is also worth noting the influence of resource-intensive manufactures in the case of exports from developing countries. It should be said, however, that there is, to a certain extent a bias in the international trade literature insofar as it tends to minimize the influence of natural resources. For instance, in Hufbauer's well-known study, the sample of 24 countries was designed explicitly so as to exclude countries which had a certain degree of specialization in resource-intensive manufactures.[15]

The hypothesis on the influence of "human capital", associated with labour skills, as an important determinant of comparative advantage, has also received important attention in empirical studies, which have provided evidence in support of this hypothesis.[16]

Here, it is worth mentioning that Ricardo recognized the importance of labour skills in his analysis of foreign trade. In the Principles, he argued explicitly about the influence of skills on the relations between international trade and the value of money[17]. On the other hand, viewed in the context of the Heckscher-Ohlin model, the inclusion of human capital in the empirical tests has been particularly useful to explain the trade patterns of highly industrialized countries, in which human capital would be relatively more abundant than both physical capital and unskilled labour.[18]

Neo-technology theories

As regards the influence of technology on international trade, one can mention the "technology gap" model developed during the 1960s.[19] According to this model, the process of technological innovation generates comparative advantage and influences the country's pattern of international trade. On the one hand, the creation of technology-specific advantages in any given country brings about trade; on the other, it leads producers abroad (potential competitors) to respond through the imitation of the country's innovation. Thus, export performance will be based on comparative cost differences induced by technological innovation and will depend upon the "imitation" lag.

The idea that comparative advantage patterns may change over time was further elaborated in the "product-life-cycle" model, where, however, the focus of analysis is on product differentiation. In this model the export performance of a country with

respect to a specific product will change over the product's life cycle. The product cycle is divided into three phases, namely, innovation, maturity and standardization. In the first phase the location of the production of a new product is confined to markets with high income and a substantial technological capability, and exports are oriented to markets with similar levels of income and taste patterns. In the second phase, the production of a maturing product may move towards other countries inasmuch as production cost, as determinant of competition in the international market, begins to be more important than product characteristics. In the third phase, the production of the standardized product may even be transferred to countries in which labour costs are significantly lower than in the country which was initially responsible for the innovation.

Empirical tests of the influence of technology-related variables on the patterns of trade have lent support to the neo-technology theories. Most studies have dealt with the influence of technology-related variables on the international trade of specific industries and countries. With respect to the empirical studies, it is worth pointing out that "it is difficult to distinguish evidence supporting technology from evidence supporting human capital or skills as determinants of trade".

Scale economies and imperfect competition

With respect to the economy of scale approach to international trade, the basic argument is quite simple: when production functions exhibit increasing returns to scale, trade patterns and export performance will depend on the absolute size of the domestic market. Therefore, large countries will tend to have a comparative advantage in industries with significant economies of scale. In this regard, economies of scale can be important in homogeneous and differentiated final products, as well as intermediate products through intra-industry specialization.

Here, it is important to mention that the pioneers of the theory of international trade, for instance, Ohlin, had already called attention to the influence of scale economies. It should be noted, however, that in the simplified versions of the neoclassical (Heckscher-Ohlin) model, it is assumed that production functions exhibit constant returns to scale and that the factors of production have a decreasing marginal productivity.

Moreover, scale economies were even discussed as an important variable in the context of export of manufactured goods from developing countries Nevertheless, the basic conclusion is that "empirical work on the importance of scale economies for the pattern of international trade has had mixed results."

In the recent past, the scale economy argument has been mostly associated with trade models based on imperfectly competitive market structures. One of the basic conclusions of these models is that "in a world where increasing returns are present, however, comparative advantage resulting from differences between countries is not the only reason for trade. Economies of scale provide an additional incentive and will give rise to trade even if countries are identical in tastes, technologies, and factor endowments."

It is also worth nothing in this connection that the idea of increasing returns is also related to the accumulation of experience, that is, to learning economies. In this respect, dynamic scale economies of the "learning curve" type will create a comparative advantage for a firm or industry that may affect the country's pattern of comparative advantage.

Demand-side theories

The influence of demand-side determination of international trade was recognized by the English classical school of Economics. It is, however, in the analyses of business cycles and in the most recent literature on trade that one can find theories that focus on demand as a major direct determinant of trade performance and patterns.

Firstly, one can mention the "demand pressure" hypothesis, which has been particularly important in the specification of export functions. The basic argument is that the pressure of domestic demand will tend to shift goods away from the external markets to the internal market. In this regard, export performance and trade patterns depend on the level of domestic absorption. In the context of "excess" of domestic demand, the export performance and the trade structure depend not only on factor endowments, technology, etc., but also on the mix and stance of macro-economic policy measures.

Secondly, the "preference similarity" approach states that the inter-country similarity of demand patterns may also be a basis for trade. Given that

income is unevenly distributed within each country, the basic argument is that consumers at different levels of income within each country will have different patterns of demand (for instance, in terms of `quality' of product), whereas consumers with similiar levels of income in different countries will tend to have similiar patterns of demand. Viewed in the context of scale economies and differentiated products markets, the overlapping demand patterns will tend to generate inter-country differences in comparative advantage, and therefore, the basis for international trade.

Finally, the third demand-oriented theory of international trade is related to attribute differentiation. According to this approach, consumers would maximize an objective function whose elements would be the characteristics of the goods, and not the amount of the goods, given the budget constraint. Thus, the amount of goods consumed would be determined through the maximization of a utility function composed of the characteristics or attributes of the goods. Given the overlapping tastes, the inter-country differences in market size, and increasing returns to scale, it may occur that consumers in any given country may demand products incorporating a certain set of atributes which can only be produced efficiently and at a lower cost in another country. Thus, the diversity of preferences with respect to attributes within each country may create a certain basis for international trade.

Conclusions

It is important to call the reader's attention to some key aspects related to the above discussion on the basic determinants of international trade.

First of all, there is no general theory of international trade in the sense that the explanatory power of any given theory is limited to specific products, industries, and countries. Therefore, on the basis of his analysis of the classical theory of international trade, Jacob Viner argued that "it may be that for such a (complex) world there is and can be no relevant general theory".

In addition, one should keep in mind that the theoretical explanations have a certain time dimension and have to be understood in a historical context. It means that for a specific country, any given theory may explain a particular trade flow in a certain moment in time. However, with changes over time in the processes of industrialization, capital accumulation, technological innovation firm strategies and development, in this country and all over the world, changes are likely to occur in the explanatory power of any given theory. This phenomenon is particularly important for developing countries which have gone through rapid processes of economic transformation. Also, strategies of large transnational corporations have also a bearing upon international trade (direction, volume, composition and terms of trade).

There is no doubt that, given the heterogeneity and complexity of the determinants of the international exchange of goods — supply-side and demand-side elements, economic influences, product-, firm-, industry-, and country-specific determinants. As a result, the scope of each one of the trade theories or models for explaining actual issues is rather limited.

According to J. Robinson, "there is no branch of Economics in which there is a wider gap between orthodox doctrine and actual problems than in the theory of international trade".

As far as the empirical evidence is concemed, it is worth noting that, "Obviously a good deal of effort over the years has gone into testing trade theories. While the tests have seldom been conclusive, many have certainly been suggestive and they have been successful in any case in stimulating the further development of trade theory in directions more consistent with empirical reality".

Moreover, it should be pointed out that the most recent theories of international trade have been, by and large, oriented to the explanation of trade patterns and performance of highly industrialized countries. The underlying dynamics of the determinants of export performance and trade patterns is quite complex and although the basic models have provided a general understanding of the problems, it should not preclude the analysis of trade-influencing factors which are, in general, outside the scope of the traditional theories of trade, such as, macroeconomic policies (e.g., exchange rates, interest rates, taxes and wages) and strategic orientation (e.g., priorities regarding resource allocation and development objectives).

Appendix

In this appendix one provides a list of some recent studies and surveys which may help the readers to go deeper into the

understanding of international trade issues, besides those mentioned in the footnotes. The main textbooks on International Economics, that are used all over the world, are marked with an asterisk (*). There are also important books dealing with international trade issues within a political economy framework, marked with two asterisks (**). And, other recent studies, that have the scope of a survey, are marked with three asterisks (***).

Baldwin, R. E., "Are economists' traditional trade policy views still valid?", Journal of Economic Literature, Vol. 30, June 1992, p. 804-29.(***)

Caves, R. E., "International differences in industrial organization", em R. Schmalensee e R. D. Willig, Handbook of Industrial Organization, Vol. II, Elsevier Science Publishers B.V., 1989, p. 1225-1250.(***)

Chipman, J. S., "International trade", em The New Palgrave . A Dictionary of Economics, vol. 2, London, The Macmillan Press, p. 922-954.(***)

Deardoff, A. V., "Testing trade theories and predicting trade flows", em R. W. Jones e P. B. Kenen (ed.), Handbook of International Economics, Vol. I, Elsevier Science Publishers B.V., 1984.(***)

Ethier, W. J., Modern International Economics, New York, Norton, 1988.(*)

Falvey, R. E., "The theory of international trade", in D. Greenaway and L. Alan Winters (eds.), Surveys in International Trade, Oxford, Basil Blackwell Ltd., 1994, pp. 9-42.(***)

Gilpin, R., The Political Economy of International Relations, Princeton University Press, 1987.(**)

Greenaway, D. and L. Alan Winters (eds.), Surveys in International Trade, Oxford, Basil Blackwell Ltd., 1994.(***)

Guillochon, B., Économie Internationale, Paris, Dunod, 1993.(*)

Hellier, J., Macroéconomie Ouverte, Paris, PUF, 1994.(*)

Helpman, E., "The noncompetitive theory of international trade and trade policy", Proceedings of the World Bank Annual Conference on Development Economics 1989, The World Bank, 1990, p. 193-230.(***)

Ingram, J.C., International Economics, John Wiley & Sons, 1988.(*)

Krugman, P. e Obsfeld, M., International Economics. Theory and Policy, Scott Foresman, 1988.(*)

Markusen, J.R. e Melvin, J.R., The Theory of International Trade, Harper & Row, 1988.(*)

Mucchielli, J-L., Principes d'Economie Internationale, Paris, Economica, 1987.(*)

Ocampo, José Antonio, "New theories of international trade and trade policy in developing countries", in M. R. Agosin and D. Tussie (eds.), Trade and Growth. New Dilemmas in Trade Plocy, London, The Macmillan Press Ltd, 1993, pp. 121-141.(***)

Odell, J. S., "Understanding international trade policies. An emerging synthesis", World Politics, Vol. 43, October 1990, p. 139-67.(***)

Salvatore, D., International Economics, Macmillan, 1987.(*)

Spero, J.E., The Politics of International Economic Relations, London, Unwin Hyman Ltd.(**)

Stewart, F., "Recent theories of international trade: Some implications for the South", em H. Kierzkowski (ed.) Monopolistic Competition and International Trade, Oxford, Clarendon Press, 1984.(***)

Strange, S., States and Markets: An Introduction to International Political Economy, New York, Basil Blackwell, 1988.(**)

[2] This paper is a completely revised, extended and updated version of a text written by the author for the United Nations Conference on Trade and Development.

[3] One can find a set of recent surveys dealing with some of the issues mentioned above in David Greenaway and L. Alan Winters (eds.), *Surveys in International Trade*, Oxford, Basil Blackwell Ltd., 1994.

[4] David Ricardo, *On the Principles of Political Economy and Taxation*, (1817), Cambridge University Press (Sraffa's edition), 1951. For an overview of the classical theory of international trade, see D. P. O'Brien, *The Classical Economists*, Oxford, Clarendon Press, 1975, Chapter 7, p. 136 sqq.

[5] For a recent survey, see E. L. Leamer, "Testing trade theory", in D. Greenaway and L. Alan Winters (eds.), *Surveys in International Trade*, Oxford, Basil Blackwell Ltd., 1994, pp. 66-106.

[6] G. D. A. MacDougall, "British and American Exports: A Study suggested by the Theory of Comparative Costs", *Economic Journal*, Vol. 61, N. 244, December 1951, reprinted in R. E. Caves and H. G. Johnson (eds.), *Readings in International Economics*, London, George Allen and Unwin, 1968, pp. 553-578.

[7] For a critique of MacDougall's paper, see J. Bhagwati, "The Pure Theory of International Trade: A Survey", *Economic Journal*, Vol. 74, March 1964, pp. 1-84, reprinted with an addendum in J. Bhagwati, *Trade, Tariffs and Growth*, London, Weidenfeld and Nicolson, 1969, pp. 3-122.

[8] See Eli Heckscher's prefatory note to the English edition of his article originally published in Sweden in 1919 : "The Effect of Foreign Trade on the Distribution of Income", in H.S. Ellis and L.A. Metzler (eds.), *Readings in the Theory of International Trade*, London, George Allen and Unwin Ltd., 1950, pp. 272-300.

[9] *Ibid*, p. 287.

[10] A. P. Samuelson. "International Trade and Equalization of Factor Prices", *Economic Journal*, Vol. 58, June 1948, pp. 163-84.

[11] B. Ohlin, *Interregional and International Trade*, Harvard University Press, 1933.

[12] W.W. Leontief, "Domestic production and foreign trade: The American Capital Position Re-examined", *Proceedings of the American Philosophical Society*, Vol. 97, 1953, reprinted in J.Bhagwati (ed.), *International Trade*, Harmondsworth, Penguin Books Ltd., pp. 93-139.

[13] For extensive surveys of the literature, see J. Bhagwati, *op.cit.*; R. M. Stern, "Testing Trade Theories", in P.B. Kenen (ed.), *International Trade and Finance. Frontiers from Research*, Cambridge University Press, 1975, pp. 3-49; and A. V. Deardoff, "Testing Trade Theories and Predicting Trade Flows", in R. W. Jones and P. B. Kenen (eds.), *Handbook of International Economics*, vol. I, Elsevier Publishers B.V., 1984, pp. 467-517.

[14] See, for instance, J. Vanek, *The Natural Resource Content of*

United States Foreign Trade, 1870-1955, Cambridge, M.I.T. Press, 1963.

[15] G.C. Hufbauer, "The Impact of National Characteristics and Technology on the Commodity Composition of Trade in Manufactured Goods", in R. Vernon (ed.), *The Technology Factor in International Trade*, New York, National Bureau of Economic Research, 1970, pp. 145-231.

[16] See, for instance, D. Keesing, "Labour skill and international trade: Evaluating many trade flows with a single measuring device". *Review of Economics and Statistics*, vol. 47, August 1965, p. 287-294.

[17] See, Ricardo, *op.cit.*, pp. 142-145.

[18] For a summary of several studies which deal with the influence of human capital, associated with skills, on the patterns of trade, see Stern (1975), *op. cit.*, pp. 12-16.

[19] See, for instance, the pioneer study by M.V. Posner, "International Trade and Technical Change", *Oxford Economic Papers*, Vol. 13, N. 3, October 1961, pp. 323-341.