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The Neo-Classical Contributions to the Theory of International Trade

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THE NEO-CLASSICAL CONTRIBUTIONS
TO THE THEORY OF
INTERNATIONAL TRADE

A Thesis
Presented to
the Faculty of the Department of Economics
Old Dominion University

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts

by
Mohammed Arifeen
June 1970
THE NEO-CLASSICAL CONTRIBUTIONS
TO THE THEORY OF
INTERNATIONAL TRADE

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ABSTRACT

In a dynamic economy some of the most challenging policy problems tend to originate in the realm of international economic relations. In the post World War II period, these problems have been intensified and become more complex. Students of international economics often feel perplexed by numerous divergent and diametric views that well-trained and prudent men frequently offer for the solutions of what appear to be rather simple problems. Lack of understanding of the theoretical framework of international trade is largely responsible for students' puzzlement.

It is the purpose of this thesis to assemble a minimum framework of the theoretical issues of neo-classical international trade theory. An attempt is made to put many of these concepts, which are scattered throughout the literature, into one concise framework. It is further hoped that arguments presented in this study would shed some light on many complex international problems and facilitate understanding of numerous pressing policy issues.

In the preparation of this study the author
acknowledges a debt of gratitude to his chairman and the members of his thesis committee for their assistance, guidance, and many valuable suggestions which considerably improved this work. Any errors, of course, remain the author's responsibility.
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CHAPTER I

INTRODUCTION

Statement of the Problem

The discipline of international trade, as a special field of economic inquiry, is richly endowed with an impressive theoretical framework. To bring the history of thought in this field up-to-date would be an enormous task and would also duplicate much effort that has been already invested in this direction. No attempt, therefore, was made in this study to reconstruct the entire history of thought for all of international trade theory; rather, the analysis was confined to the development of important contributions of the neo-classical school to the pure theory of foreign trade. The neo-classical school of international trade was defined in this study to include the work of Marshall, Edgeworth, Viner, and early writings of Haberler, Leontief, Lerner and Meade.

All too often, serious students of international economics convey an erroneous impression that there exists little or no professional disagreement over fundamental theoretical issues of international economics.
The evidence presented by the survey of the literature, however, fails to support this commonly-held notion. On the contrary, controversial aspects of theoretical exposition are debated frequently throughout the literature. As a matter of fact, the debate over theoretical issues in international economics is still quite vigorous. The basic expositions of international economic theory are still being formed and tempered. The arguments involved in these controversial issues, though inordinately difficult, are dissipated throughout the literature.

It is the purpose of this thesis to assemble the minimum framework of the theoretical issues of the neoclassical international trade theory. An attempt is made to put many of these concepts, which are scattered throughout the literature, into one concise framework. It is further hoped that the arguments presented in this study would shed some light on many complex international trade problems and facilitate their understanding.

In order to keep the scope of the study within manageable limits, the following areas were selected for research: (a) shifts of international demand, (b) changes in international demand, (c) determinateness of international equilibrium, (d) theory of international
value, (e) the concept of community indifference curves, and (f) the controversy of real and opportunity cost approaches.

Sequence of Chapter Development

Chapter II contains a brief discussion of the Marshallian analysis of the effect of international demand on the terms of trade. Marshall conducted his analysis in terms of the elasticities of reciprocal demand and supply curves, and the correct interpretation of these elasticities has been the source of a prolonged controversy. The major attack on Marshall's exposition came from Graham. Chapter II, therefore, includes a rather detailed presentation of his criticism along with the views of Haberler, Bresciani-Turroni, Viner, Duncan, Kemp, Bhagwati and Johnson on the controversy.

Chapter III summarizes Marshall's treatment of Mill's international value problem in terms of his offer curves. It has been argued that Mill's law indicated that as long as an equilibrium solution to the equations of international demand existed, the economic system was stable, in the sense that some equilibrium price constellation would be reached. Included in Chapter III are the views of Chipman, Joan Robinson, Lerner, Samuelson, Bhagwati and Johnson on the stability of international equilibrium.
Chapter IV contains two sections. The first section describes Edgeworth's views on the theory of international value. Edgeworth was concerned to show that in case of barter trade between two countries for two commodities the rate of exchange was indeterminate. It was in the course of this analysis that his contract curve appeared. The first section also reviews Viner's criticism of Edgeworth's graphic presentation. The second section contains a description of Leontief's application of indifference curve approach to the theory of international trade, and of the subsequent derivation of community indifference curves. This chapter also includes a summary of the views of Heller, Lerner, and Scitovsky and of the criticism advanced by Samuelson and Caves regarding the concept of the community indifference curve.

Chapter V expounds on the controversy of real and opportunity cost approaches. The quest for a more realistic measure of cost in the theory of international trade led economists to use the real cost approach to the problem of value. As an alternative, Haberler introduced the opportunity cost approach; he employed this concept for the construction of a production transformation or substitution curve. The chapter also summarizes the views
of Viner, Chipman, Kindleberger, Caves, Samuelson and Walsh on the controversy.

Chapter VI presents conclusion of this study.
CHAPTER II

MARSHALL ON THE SHIFTS OF INTERNATIONAL DEMAND

The Ricardian exposition of international trade was based upon the assumption of relative or comparative cost differences between two nations. A country would export that commodity in which it had a comparative advantage, whether or not it had an absolute advantage as suggested by Adam Smith. The international pattern of the division of labor and localization of production was determined by comparative costs and not by absolute costs. Each country would tend to specialize in the production of those commodities in which its labor costs were comparatively lowest.

Although the theorem of comparative cost marked a significant advance over Adam Smith's treatment of the basis of international trade, it failed to explain the question of the terms of trade. In other words, even though it explained why trade takes place, it did not go far enough to explain on what terms. In his notable essay, "On the Laws of Interchange between Nations," which appeared in 1844, John Stuart Mill proceeded to find a precise solution to the problem left open by
Ricardo, namely, what determined the terms of trade.¹

Instead of one particular trade ratio that Ricardo implicitly assumed would settle strictly in between the domestic comparative cost ratios, Mill argued that there would be a whole range of alternative terms of trade. Which particular trade ratio would be common to both countries would be determined by "the Equation of International Demand," which Mill contended was an extension of a more general law of value, and was called "the Equation of Supply and Demand."² In other words, Mill argued that the actual terms of trade at which goods were exchanged would depend upon the strength and elasticity of one country's demand for the other country's product, or what might be termed as reciprocal demand.

The theory of international value, presented by Mill, was further systematically developed by Marshall with the help of diagrams and other analytical tools. In this chapter an attempt is made to summarize Marshall's analysis of the shifts of international demand, and the


controversy which followed regarding the correct interpretation of the elasticity of his reciprocal demand and supply curves.

**Shifts of International Demand**

Marshall introduced the concept of reciprocal demand and supply curves into Mill's analysis. He defined "reciprocal" to mean that the demand curve of country A for the produce of country B was simultaneously A's supply curve of its own export. Haberler cautioned that the Marshallian reciprocal demand and supply curves should not be confused with the following:

3. Ordinary demand and supply curves, which functionally relate the quantity demanded and quantity supplied of a commodity to its money price.

4. The export-supply and import-demand curves which indicate the quantity of exports or imports of one commodity as a function of the market price, and,

5. The supply curves for total exports and demand curves for total imports, which show the volumes of exports and imports as a function of average export and import money prices, respectively.

While (1), (2), and (3) were tools for partial equilibrium analysis, Marshall made use of his more

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complex curves to present a general equilibrium in international trade. Each point along these curves was a possible equilibrium point and each movement along these curves indicated that the economy of the country concerned had adapted itself to the new equilibrium situation.

In his remarkable work *Money, Credit, and Commerce*, Marshall considered the effect of shifts of international demand on the terms of trade. His model also dealt with two countries and two commodities; however, he assumed exports and imports were composed of a larger number of different commodities. The units which he employed in his analysis were "representative commodity bales," which he defined as containing a constant quantity of labor or means of production in general. Thus, while the commodity composition of the bales might change, their real costs remained constant. The commodity composition of the bales changed not only when curves shifted automatically, e.g., due to technological innovations, but also as a result of equilibrating adjustments, i.e., individual commodities shifted from the export to the import side and vice versa.

Normally if the tastes of the consumers in a given country shifted so that they wished to consume relatively

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Ibid.
more imported goods than before, the country's terms of trade worsened. Marshall attempted to analyze the effects of such a shift of international demand on the terms of trade. He assumed reciprocal demand curves of the two trading countries, E (England) and G (Germany), as given, E's having shifted to reflect increasing preference of English consumers for German goods. He arrived at the following conclusion:

The more elastic the demand of either country, the elasticity of the other being given, the larger will be the volumes of both her exports and of her imports; but the more also will her exports be enlarged relative to her imports; or, in other words, the less favourable to her will be the terms of trade. Thus both sides of the trade will be very greatly enlarged; if both elasticities are great. But if both are small G's exports will be increased only a little; while E's will be increased by the original amount and a very little more in addition.5

A geometrical demonstration of this conclusion is reproduced here from Appendix J of Marshall's work cited above.6 In Figure I, OE and OG represent respectively E's and G's demand curves for each other's produce. As a result of an increase in E's demand for G's goods OE shifts to a new position OE'. Through A, the old position of equilibrium, CAa is drawn horizontally. The number Oh


6Ibid., pp. 342-46.
FIGURE I

INFLUENCE OF VARYING DEGREES OF ELASTICITY
OF DEMAND ON THE TERMS OF TRADE

of her bales, which E will give for CO, or AB, of G bales is greater than OB; and the number pB of G bales which she is willing to accept in exchange for OB of hers, is less than AB.

OD and Od are obtained by drawing lines from the origin which pass through the equilibrium points, A and a. The area DAad from Figure I is reproduced on a larger scale in Figure II in order to examine the influence exerted on the position of new equilibrium by the elasticities of E's and G's demands. AG, AG' and AG" are G's demand curves representing great, medium, and small elasticities, respectively. Similarly, aE, aE' and aE" are E's demand curves with differing elasticities.

The first set of results is that shown by the intersection of the three positions of E's demand curve, with OG representing a high elasticity in G's demand. Since J, K, L lie above A, they all indicate greater exports of G's produce. The next set of results is obtained when G's demand is moderately elastic, and is represented by OG'. Though the positions of R, S, T differ from each other in the same direction as J, K and L, the differences are smaller. The character of G's demand dominates the last set of results. Intersection of G's very inelastic demand curve, OG", with the three
FIGURE II

RELATION BETWEEN THE RELATIVE CHARACTERS OF THE TWO COUNTRIES' DEMANDS AND THEIR TERMS OF TRADE

positions of E's demand curve, produce points U, V and W, which are close to each other and also to A. Each of these points represents unfavorable terms of trade for E. She has to accept smaller increases in the supply of G's goods while she is offering more than proportional increases in her exports.

Marshall's conclusion indicates that the more elastic a country's demand for the other country's products the greater will be the adverse change in the price of its imports. This appeared in conflict with ordinary demand analysis which asserted that the more elastic the demand for a given product, the less was the change in price that was associated with a given change in quantity. Thus, Marshall's proposition appeared to be contrary to general expectations. It was this aspect of Marshall's proposition that aroused considerable controversy concerning its validity, and was often referred to in the literature as "Marshall's Paradox."

Kemp pointed out that the difficulty in Marshall's proposition lay in the fact that he always took into account cases where the elasticity of both reciprocal demand curves exceeds unity and that there was more than
one way to define a shift in international demand. Kemp differentiated between three types of demand shifts:

Type I, a uniform increase in the amount of E-goods offered per unit of G-goods,
Type II, a uniform increase in the amount of E-goods offered for G-goods at any given terms of trade, and,
Type III, a uniform decrease in the amount of G-goods demanded for any given quantity of E-goods supplied.

Kemp argued that when England's reciprocal demand increased, her terms of trade deteriorated less if Germany's reciprocal demand curve was more elastic while that of England was held constant. They deteriorated more, the more elastic was England's curve, and the elasticity of Germany's demand curve was greater than unity. Finally, England's terms of trade again deteriorated less, the more elastic her curve when Germany's curve had (constant) elasticity less than unity. Kemp asserted that these conclusions for type I shifts were fully consistent with Marshall's except that the latter disregarded inelastic functions and, thus, did not mention the last possibility.

Changes in International Demand

The major attack on Marshall's exposition came

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from Graham. Graham agreed with Marshall that England's terms of trade would deteriorate less if Germany's reciprocal demand for England's goods were more elastic. However, Graham also asserted that the deterioration of England's terms of trade again would be less, and not more as Marshall indicated, the more elastic was England's demand for Germany's goods. Graham interpreted Marshall's definition of an elastic demand schedule for imports to imply that as the terms of trade turned against England because of the increase of her demand for Germany's goods, England would import a quantity of Germany's goods which varied inversely with the movement of the terms of trade. Conversely, an inelastic demand schedule for imports would signify a direct correlation between the volume of England's imports and exports and the movement in the terms of trade. On the basis of this argument he concluded that the correct solution of the problem was just the opposite of that given by Marshall:

The more elastic the demand of E, the demand of G being given, the smaller will be the volume of E's imports and exports, and the less will her exports be enlarged relative to her imports.9

Professor Bresciani-Turroni defended Marshall's


9Ibid., p. 601.
position and defied Graham's conclusion. \(^{10}\) He pointed out that Marshall's proposition was based on the fact that he illustrated the increase in England's demand for Germany's goods by an increase in her quantity of exports for a given quantity of imports, i.e. by an increase in the price (terms of trade) which was paid for these imports. He did not represent the increase in England's demand by an increase in the quantity of her imports which were taken at a given price (terms of trade) as Graham did. It was, therefore, in presenting Marshall's problem in terms of the latter case that the Graham solution was correct, i.e., the more elastic England's demand for Germany's goods, the smaller were the volumes both of her imports and her exports and the more favorable to her the terms of trade. Professor Bresciani-Turroni's conclusion was that both Marshall and Graham were right. The result depended on how the increase in England's demand was illustrated.

It was apparent from Viner's discussion that he attempted to restore Graham's conclusion and reaffirm Marshall's error. \(^{11}\) Viner felt that Marshall's reciprocal


demand diagrams were deficient in explaining the case of inelastic demand curves. He transformed England's offer curve into a terms of trade diagram. He did that by labeling the abscissa to indicate the number of units of England's goods and the ordinate to measure the terms of trade or G-units per E units. After transforming the English reciprocal demand schedule to this diagram, Viner shifted it to the right and came up with the Graham conclusion that the deterioration in England's terms of trade would be less, the more elastic her demand curve for Germany's goods.

Figure III is reproduced here from Viner's work cited above. Country G's reciprocal demand curve is represented by GG, country E's less elastic reciprocal demand curves before and after the increase in demand by EE and E'E', respectively, and country E's more elastic corresponding curves by ee and e'e'. The diagram supports Graham's argument that increase in E's exports would be less if its reciprocal demand curve were more elastic, since Om < Om', and also that the deterioration of E's terms of trade would be of a smaller degree, since Aa < Aa'.

12 Ibid., p. 545.
FIGURE III

INFLUENCE OF AN INCREASE IN DEMAND ON THE TERMS OF TRADE

Professor Duncan found himself in disagreement with Viner. He questioned the shift of Viner's curve to the right as equivalent to the shift of Marshall's curve to the right.\textsuperscript{13} He also believed that Viner's and Marshall's graphs were not identical. By illustrating the increase in England's demand as an increase in the quantity of imports which would be taken at a given price, Duncan pointed out that Viner was not using the same method of presenting an increase in demand as Marshall did, even though the direction of the shift of Viner's curve was the same. To have followed Marshall, Viner should have presented an increase in demand by an increase in the quantity of exports (an increase in price) which would be paid for a given quantity of imports, or by a decrease in the price at which a given quantity of English exports would be offered. Duncan therefore asserted that, in order for Marshall's solution to hold, Viner should have shifted the English curve vertically down instead of to the right. His conclusion was that for Marshall's or Viner's graphs the solution depended on the manner in which England's demand curve depended.

\textsuperscript{13}Acheson J. Duncan, "Marshall's Paradox and the Doctrine of Shift in Demand," \textit{Econometrica}, VI (October, 1938), 360.
was shifted and that a shift in a given direction on one diagram was not necessarily an equivalent shift on the other diagram.

Professor Kemp, however, found it difficult to go along with Duncan. He maintained a downward shift of England's demand curve was not the same as a shift of the Marshallian curve uniformly to the right.\(^ {14}\) In Kemp's terminology, it was a type III shift, i.e. a decrease in the quantity of import demanded for a given quantity of exports. Kemp believed that Marshall's proposition was primarily concerned with type I shift, i.e., a uniform increase in the amount of E-goods offered per unit of G-goods.

Bhagwati and Johnson, in their fairly recent article, also reviewed this controversy between Marshall and Graham.\(^ {15}\) They summarized Marshall's argument stating that the degree of the deterioration of E's terms of trade would vary directly with E's elasticity of demand for G's imports and inversely with G's elasticity of demand for E's imports. The magnitude of the increase

\(^ {14}\text{Kemp, op. cit., p. 46.}\)

in the volume of trade would vary directly with both these elasticities. Graham, they believed, on the other hand, held that deterioration in E's terms of trade would vary inversely with both these elasticities while the size of the increase in the volume of trade would vary inversely with E's elasticity and directly with G's elasticity. Bhagwati and Johnson arrived at a similar conclusion as did Bresciani-Turroni, Kemp, and others. Both maintained that the answer to the problem of how the elasticities of reciprocal demand affected the extent of functional relationship of price and quantity exchanged, whenever there was a shift in international demand, depended on the manner in which such a shift was defined. There were two possible definitions of such a shift. The first was the Graham type definition, and the second was the Marshall type:

1. A change in the quantity demanded (supplied) at a given price, and,
2. A change in price at which a given quantity is demanded (supplied).

The definition chosen determined whether Marshall or Graham's solution was correct. Bhagwati and Johnson believed that both solutions were useful in the analysis of international trade problems. Graham's approach was more acceptable when the problem was to examine the effect
of some change on the volumes and terms of international competition. Under such conditions the direction of change of international equilibrium could be predicted from the effect of the change on quantity demanded at the initial price. Examples were the transfer problem and the effect of economic expansion on international trade equilibrium. Marshall's approach was more convenient when the problem was to determine the effect of a change in a country's commercial policy on its internal equilibrium price and quantities, since the direction of change of this equilibrium could be predicted from the effects of the tariff on the quantity of imports demanded at the initial internal price, and the corresponding reduction of the external price on the quantity of imports that the foreigner would supply.

After the Bhagwati and Johnson article, the controversy over the effects of elasticities of reciprocal demand on the terms of trade subsided.
CHAPTER III

DETERMINATENESS OF INTERNATIONAL EQUILIBRIUM

The graphical treatment of the pure theory of international trade was first introduced in the literature by Marshall in his work on *The Pure Theory of Foreign Trade*, published in 1879.¹ The starting point was his geometric treatment of Mill's international value in terms of his reciprocal demand curve, now usually known in the literature as "offer curve." The effort initiated by Marshall was carried forward by Edgeworth, Leontief, Meade, and other international trade economists.

On the question of Mill's views on the stability of international equilibrium, survey of the literature presented a divided opinion of the economists. However, some consensus was noted on the argument that Mill's law indicated that as long as an equilibrium solution to the equations of international demand existed, the economic system was stable, in the sense that some

equilibrium price constellation would be reached. Although Mill did not use the terms "stable" and "unstable" in his analysis, he made it sufficiently clear that the process which he was discussing was a dynamic process of adjustment. Chipman supported this argument by quoting Mill in his article:

If at the market price the demand exceeds the supply, the competition of buyers will drive up the price to the point at which there will only be purchases for as much as is offered for sale. If, on the contrary, the supply, being in excess of the demand cannot be all disposed of at the existing price, either a part will be withdrawn to wait for a better market, or a sale will be forced by offering it at such a reduction of price as will bring forward new buyers, or tempt the old ones to increase their purchases. The law, therefore, of values, as affected by demand and supply, is that they adjust themselves so as always to bring about an equation between demand and supply, by the increase of the one or the diminution of the other; the movement of price being only arrested when the quantity asked for at the current price, and the quantity offered at the current price, are equal. This point of exact equilibrium may be as momentary, but is nevertheless as real as the level of the sea... 2

According to Chipman this was as far as Mill went without the aid of mathematical techniques. From this point the analysis was carried forward by Marshall who argued that Mill's treatment of the stability conditions

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was inadequate. Although the possibility of more than one position of equilibrium had been noticed by Mill, Marshall thought:

His treatment of the matter is certainly inadequate: for he has failed to discover the laws which determine whether any particular position of equilibrium is stable or unstable.\(^3\)

Marshall implicitly defined his offer curves in such a way that each point on a country's offer curve corresponded to a situation of balanced trade.\(^4\)

The implication of this definition was that for any given terms of trade facing a particular country, a "partial" equilibrium existed ("partial" meaning really "hypothetical," i.e., it did not need to be consistent with the hypothetical equilibrium reached by the other country) at which that country's trade was balanced. Given this definition of offer curves, Marshall proposed that international demands were so inelastic in the neighborhood of an equilibrium point as to make that equilibrium unstable. This necessarily implied the existence of at least two points of stable equilibrium, one at a higher and the other at a lower exchange ratio than the unstable equilibrium ratio. In other words, the


\(^4\)Ibid., pp. 6-7.
Marshallian instability of equilibrium implied an odd number of equilibrium prices, alternately stable and unstable:

On the extreme hypothesis that each of the imaginary countries, in exclusive trade with one another, had an urgent demand for a small quantity of the other's goods, but could find no good use for any large quantity of them, then there might be several positions, alternately stable and unstable, of equilibrium between them.⁵

Marshall's argument on instability conditions, therefore, may be summarized by saying that if offer curves of two countries (England and Germany), OE and OG in Figure IV,⁶ both belong to the "exceptional demand class," they may cut one another three or any other odd number of times, not counting O (origin). The first point of intersection reached from O in either direction is a stable equilibrium, the second point is unstable, and the third is stable and so on. Exceptional demand class refers to a situation where the demand of a country for foreign goods may be so inelastic as to be completely glutted by a little oversupply, and any further increase in supplies could be sold only for a


FIGURE IV

EXCEPTIONAL DEMAND AND STABILITY OF EQUILIBRIUM

smaller aggregate return.

In Figure IV, A represents a point of stable equilibrium, B of unstable, and C of stable equilibrium. The two positions of stable equilibrium shown in this figure are far apart from each other, and if the terms of trade are set at one of these positions, say, at A, they would, when disturbed oscillate about A. The terms of trade would swing alternately to the left and right of A, and would not move all the way to C, unless they were pushed in that direction by some violent disturbance. Whether they would stay at C or revert to A would depend on the relative strength of the various forces involved, such as the character of the supply of and the demand for factors of production. The terms of trade would be susceptible to violent disturbances, if it were difficult to find sufficient labor and capital for expansion of exports, or to absorb elsewhere the labor and capital displaced as a result of a cutting down in exports.\(^7\)

A survey of the literature indicated that no well recognized controversy existed over the Marshallian proposition, although some opposite views were stated by

\(^7\)Marshall, op. cit., p. 354.
different writers. Most of these views were expressed in connection with the theory of devaluation and floating exchange rates, and asserted the possibility of a stable lower equilibrium.

Joan Robinson analyzed the interaction between movements in the balance of payments and fluctuations in the exchange rates, and she pointed out the possibility of the existence of a stable lower equilibrium rate of exchange. A deficiency in the balance of trade, she argued, would lead to exchange depreciation, and if the foreign demand and domestic supply of exportable goods were perfectly elastic, this depreciation would improve the balance of trade and would prevent any further fall in the exchange rate. According to Mrs. Robinson, trade would always be in balance between countries on the gold standard, since any tendency for the exchange rate to fall would be mitigated by an infinitely large export of gold and, similarly, a rise in the exchange rate would be prevented by an infinitely large import of gold.

The situation, Robinson contended, would be absolutely different in the case of floating exchange rates. If the elasticity of foreign demand for exports and that of home demand for imports were low, a chance fall in the
exchange rate would precipitate a progressive decline, since each fall in the rate would adversely affect the trade balance and would promote a further fall. Apparently, in such a situation only some sort of state control could prevent a sudden collapse. Mrs. Robinson, however, asserted the possibility of the emergence of a stable lower equilibrium rate of exchange on the ground that "a sufficiently violent rise in the price of imports must ultimately choke demand, and even if exports fail to react in the flurry of the moment, the value of imports must somewhere begin to fall off." Abba Lerner argued in terms of constant elasticities which he believed might be too low for stability. If the elasticity of home demand, Lerner asserted, was above zero by the degree to which the elasticity of foreign demand was below unity, the two forces would just cancel each other, and the fall in domestic prices would not influence the import balance in any manner. The sum of the two elasticities was unity in such a situation. A fall in the price level would correct the import balance and thus would check the outflow of gold,


9 Ibid., p. 201.
if the sum of two elasticities was greater than unity. There would be "perverse" movement of the import balance, if this sum was less than unity.

Lerner believed that the tendency to assume high elasticities could be attributed to the fact that they would fit in better with the concept of perfect competition. In the real situation these elasticities were quite low; in fact the sum of two of them was usually less than unity. The elasticity of the demand for exports was low because, firstly, very often buying countries were so large that they enjoyed monopsonistic control over prices and, secondly, any attempt on the part of a country to devalue its currency or to correct its import balance by subsidizing exports would promote retaliation by other countries in the form of tariffs and quotas. Similarly, demand for imports could be inelastic due to the fixation of quotas. In view of these low elasticities, Lerner agreed with the Marshallian proposition in the following passage:

One country after another is forced off the gold standard finds its currency depreciating without this affording much relief, and is able to find a stable position only after a long fall in the value of its currency and the introduction of special restrictions on trade have so altered the situation that the elasticities are no longer
The only evidence of attack on the Marshallian proposition, other than Bhagwati's and Johnson's, that a survey of the literature indicated, was contained in Paul Samuelson's "Disparity in Post War Exchange Rate." 11 There, while questioning Joan Robinson's contention that perverse inelasticity of demand was not fatal to the classical analysis, he quoted, in a footnote, her re-statement of the classical position in her article, "The Pure Theory of International Trade." 12 He said:

At a critical point in her argument she assumes as obvious what is not universally necessarily true. She says "at some point the goods become so expensive relative to world money incomes that demand turns elastic . . . and there is some level . . . at which exports fall to zero." I grant that it is customary to draw demand curves so that at high prices they touch the price axis and become elastic. Probably this is realistic. But it is not universally necessary as a matter of logic. It is easy to specify indifference curves such that demand is always inelastic. 13


13Samuelson, op. cit., p. 409.
Samuelson further elaborated that even if an elastic range of curves existed beyond the prevailing region of inelasticity, it would necessitate drastic adjustments of exchange rates and relative prices before imbalance could be corrected. The terms of trade would have to deteriorate to a considerable extent before any improvement in the balance of trade could be achieved.

Bhagwati and Johnson argued that Marshall's proposition was a consequence of the manner in which his offer curves were drawn. They observed two characteristics of each offer curve:

1. It passed through the origin, implying that there existed a finite high price of imports at which the demand for imports was terminable, and,
2. It did not join the import-good axis as the price of imports fell, implying that the demand for imports was inelastic at a lower price.

It was these characteristics, they contended, that ensured that the reciprocal demand curves intersected once above and once below the unstable equilibrium price. However, they asserted that "neither of these characteristics is a necessary logical consequence of

demand theory: on the contrary, both are empirical assumptions."\textsuperscript{15} They further indicated that both characteristics of Marshall's offer curves were inconsistent with his own assumption that each country had an urgent demand for a small quantity of the other country's goods but did not find any good use for a larger quantity of them.

In their concluding remarks, Bhagwati and Johnson suggested the following possibilities of stable and unstable equilibrium:\textsuperscript{16}

1. If it was assumed that neither of the assumptions was valid for either country, and, therefore, the demand for imports was interminable but satiable in each country, then the unstable equilibrium was the only equilibrium possible at a finite exchange ratio.

2. If one country's demand for imports was assumed to be satiable but not interminable, while the other country's import demand was interminable, then there was only one stable equilibrium possible at a finite exchange ratio entailing a higher price for the first country's imports than the unstable equilibrium price ratio.

3. If one country's demand for imports was not satiable but was assumed to be interminable while the other country's demand was both satiable and interminable, then there was again only one stable equilibrium possible at a finite exchange ratio entailing a lower price for the

\textsuperscript{15}Ibid., p. 92.

\textsuperscript{16}Ibid., p. 92.
FIGURE V
POSSIBILITIES OF STABLE AND UNSTABLE EQUILIBRIUM

first country's imports than the unstable equilibrium price ratio, and,

4. If the import demand in one country was both insatiable and terminable or satiable but terminable, or insatiable but interminable in both countries, then there was a stable equilibrium at both a higher and a lower exchange ratio than the unstable equilibrium price ratio.

Figure V is reproduced here from Bhagwati and Johnson's article cited above to illustrate the different possibilities of stable and unstable equilibrium graphically. The first possibility mentioned above is illustrated by the offer curves $O_e E'$. The second case is represented by the combination of $OE'$ with $Og G$ or $Og G'$ and of $OG'$ with $Oe E$ or $Oe E'$. The third possibility is represented by the combination of $Oe E$ with $Og G'$ and of $Og G$ with $Oe E'$. Finally, combinations involving $OE$ or $OG$, the combination of $OE'$ and $OG'$, and that of $Oe E$ and $Og G$ represent the fourth case.
CHAPTER IV

INTERNATIONAL VALUE AND COMMUNITY INDIFFERENCE CURVES

Edgeworth on the Theory of International Value

Among those distinguished economists who contributed to the development of the pure theory of international trade, the name of Francis Y. Edgeworth could scarcely be overlooked. He wrote frequently on the theory of international trade. His original indifference curves, which first appeared in the analysis of the pure theory of international value, were drawn upside down as compared with their present familiar form in which they were first drawn by Fisher or Auspitz and Lieber. ¹ Hutchison indicated that the type of diagram in which Edgeworth's indifference curve first appeared might have been suggested by Marshall's graphics (offer curves) in The Pure Theory of Foreign Trade.

Edgeworth was concerned to show that in case of barter trade between two individuals for two commodities

the rate of exchange was indeterminate. It was in the course of this analysis that Edgeworth's contract curve appeared, i.e., the curve which traced out the possible points of settlement between the two parties. In his treatment of the relation of reciprocal demand to the terms of trade, Edgeworth further elaborated Marshallian graphical techniques; however, the use of the indifference curve in the theory of foreign trade was perfected by Leontief in 1933.

In his article on the "Theory of International Value," Edgeworth considered several cases of the effect of reciprocal demand on the terms of trade. Of special interest is the case in which he explained the value of the relationship between comparative costs and reciprocal demands. In explaining this relationship, Edgeworth constructed a diagram on the Marshallian model, where the vertical axis represented total amount of German linen and the horizontal axis represented total amount of English cloth (see Figure VI). The lines OS and OT

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3Viner criticized the shape of the offer curves of Edgeworth's diagram. This criticism, he believed, applied equally to all of Marshall's diagrams which were supposed to represent the case of two classes of commodity both of which were produced at home at constant relative costs. See Jacob Viner, Studies in the Theory of International Trade (New York: Harper and Brothers, 1937), pp. 543-46.
FIGURE VI

COMPARATIVE COSTS AND RECIPROCAL DEMANDS

therefore, represented the terms on which England could obtain linen and Germany could obtain cloth in the absence of trade. He called curve OE England's "supply-and-demand" curve which indicated a quantity of Ox of English cloth exchanged for a quantity of Oy of German linen. Germany's supply of linen and demand for cloth were similarly expressed by the curve OG. The equilibrium terms of trade, he believed, must fall between the lines OS and OT. Edgeworth also stated that if production was not carried under conditions of constant costs then a "curve of constant advantage" or "indifference curve" should be substituted for the straight line OS and OT (not shown in his diagram) representing "states for which the advantage to England is not greater than if there had been no trade."\(^4\) This Viner interpreted to mean a curve illustrating states for which the importation of an additional unit of Germany's good by England would be no more advantageous than its production at home, if this curve is "to be the analogue for variable costs of his OS line."\(^5\)

The use of indifference curves in the pure theory


\(^5\)Viner, op. cit., p. 548.
of foreign trade, however, was never entirely perfected by Edgeworth. The credit for this accomplishment and the establishment of the concept of community indifference curve for analytical purposes went to Leontief.

The Concept of Community Indifference Curves

Leontief in 1933 demonstrated one of the original descriptions of the application of an indifference curve approach to the theory of international trade. His method of analysis became a recognized standard analytical technique in the pure theory of international trade. A highly rigorous statement of the analysis was also provided by Donald Marsh. No effort, therefore, is made in this section to reconstruct the theory of indifference curves as it applies to the pure theory of foreign trade, rather the analysis shifts to the discussion of the community indifference curve. However, it suffices here to say that an indifference curve is defined as the collection of all commodity combinations which yield the same amount of satisfaction or utility


to a consumer.

Indifference curves may be defined for individual persons or an aggregate indifference curve may be derived for all residents of a given country, often referred to as a community indifference curve. Such a community indifference curve is employed to illustrate the preference patterns for the country as a whole and is defined as a curve which depicts all commodity combinations that will yield constant utility to the members of the community—individually and together.  

In Figure VII a community indifference curve is derived from the indifference maps of two individuals, A and B; the analysis can be extended to cover any number of individuals. Quantities of the two commodities, cloth and wheat, are measured along the two axes. IA represents A's indifference curve, and IB that of B, but it is drawn upside down and the sides are reversed. The tangency at M assures that no reallocation of resources could improve the welfare of one person without worsening that of the other. It is possible to slide the two indifference curves along each other. Leaving the origin of

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FIGURE VII
DERIVATION OF COMMUNITY INDIFFERENCE CURVE

A's coordinate system, OA, constant, B's coordinate system and the indifference map are moved down and to the right. Point N shows the new tangency position; both consumers are still on the same indifference curve as at point M, but the respective quantities of cloth and wheat consumed by each individual have changed. The moving point OB generates a curve which represents various combinations of cloth and wheat that are required to keep both the consumers on the same indifference curve. Since each consumer individually stays on the same indifference curve, the points generated by the moving origin illustrated commodity combinations between which the consumers together are indifferent. The locus of these points defines the community indifference curve.\(^9\)

The community indifference curve assumes that the utility and preference functions of all citizens are identical, and that the proportions in which commodities are consumed depend only on relative commodity prices, and not on the level of income or of utility. It is also argued that a community indifference curve permits one to draw certain welfare conclusions if the country moves

from one indifference curve to another. Leontief employed community indifference curves to represent national demand. Leontief, loc. cit. Lerner insisted that "the behavior of the community with respect to these curves is exactly comparable to that of an individual with respect to his true indifference curve," even if there were some ambiguity about the estimation of an absolute level of community satisfaction. Scitovsky defined the community indifference curve as loci of quantities demanded at various price ratios and a given fixed distribution of utilities among individuals. Thus, he recognized that through any point of commodity space there will, in general, pass an infinite number of aggregate indifference curves, one for each distribution of utilities compatible with that particular aggregate demand. In other words, the essence of Scitovsky's contribution was that community indifference curves can, and in many situations do, intersect and cross each other.

10 Leontief, loc. cit.


A close scrutiny of the community indifference curves indicated that the concept was open to serious questions. Samuelson argued that the community indifference curves defined in the usual sense and with the usual properties were impossible and they just did not exist.\(^{14}\) He criticized the naive assumption behind the community indifference curves that an aggregate utility function for a group of individuals could be realistically defined. Instead he presented his own "impossibility theorem," which stated that an aggregate utility function could be defined, invariant with respect to all redistributions of initial endowments, if and only if all utility functions were identical and homothetic to the origin. He refuted one by one all arguments that were put forth in defense of community indifference curves as unrealistic and naive. Arguing against the assumption of an aggregate utility function and homogeneous indifference curves, he pointed out that:

\[\ldots\text{Within the framework of elementary international trade theory, where transport costs are ignored, two men within a country have no more in common than do any two men selected from anywhere in the world. Logically, therefore, it will be as hard or as easy to draw up community indifference curves for the whole world as to do it for any subgroup of individuals.}\]^{15}

\(^{14}\text{Ibid., pp. 1-4.}\)

\(^{15}\text{Ibid.}\)
Richard Caves contended that as Marshall's "Representative Bales" was an effort to solve the problem of aggregation over commodities, the community indifference curve was an effort to circumvent the difficulties of consistent aggregation over individuals. However, he argued, that the effort had been without any significant success. Like Samuelson, he also found the community indifference curve concept shaky and based upon unrealistic assumptions, despite the regularity with which it had been used as a tool of analysis in the pure theory of foreign trade. The efforts to find a simple solution to the problem of aggregation over individual demand patterns, Caves believed, had thus far failed.

The Ricardian exposition of the comparative cost doctrine was stated in terms of unit labor cost, and it was explicit in the analysis that the relative values of the commodities produced within each country would be proportional to their labor-time costs. The same line of argument was followed by many leading classical economists and other exponents of the doctrine of comparative costs; none of them, however, with the relatively unimportant and minor exception of James Mill, was a serious exponent of the labor theory of value. In fact, almost all classical economists recognized the role of other factors of production in addition to labor. Malthus and Torrens clearly rejected the labor cost theory of value. John Stuart Mill, although he presented the doctrine of comparative cost (in keeping with classical tradition) in the terminology of labor cost theory, disassociated himself from the strict labor cost theory and in his Principles rejected it in the discussion of general theory.
value. Senior and Cairnes also followed Mill in de-
emphasizing the role of the labor theory of value in
the doctrine of comparative cost and dealt with real
costs in terms of "labor and abstinence" or "labor and
capital." Later writers, such as Edgeworth, Bastable,
and Loria, argued at great length on the question of
the definition and the measurement of "costs" and sub-
stituted such expressions as "units of productive power"
for the quantities of labor in expressing the doctrine
made "quantities of labor" represent combinations of
the factors of production. The quest for a more real-
istic measure of cost in the theory of international
trade, therefore, led classical economists to use the
term "real costs" of labor.

The real cost of labor was defined in terms of
the efforts or sacrifice of labor required to produce
a commodity and the sacrifice involved in providing the
necessary capital. The latter sacrifice received little
attention on the assumption that capital was so evenly
spread over the labor employed in the manufacture of
exportable goods that this constant proportion could be neglected. Thus, the real cost of producing goods was measured in their proportion to the sacrifices, "disutilities," or "irksomeness" of providing productive services.

Viner presented a highly rigorous defense of the real cost theory of value of the classical economists.² He strongly defended the validity of the comparative cost doctrine on the basis of the real cost theory of value, which he asserted was not simply a labor cost theory of value, even when expressed in such terms. Viner maintained that by real costs classical economists meant all subjective costs (not labor cost alone) directly associated with production:

The irksomeness of labor, whether in comparison with leisure or with some other kind of labor, and the "abstinence" associated with voluntary postponement of consumption, were for them the important real costs.³

The main argument of the real cost theory of value was that there is a strong presumption of rough proportionality between market prices and real costs. In other words, real costs were proportional to the

²Ibid., pp. 489-526.
³Ibid., p. 492.
sacrifices, "irksomeness" or "disutilities" of providing all productive services. Many economists believed that the theory seemed to be largely a holdover from the labor theory of value. However, Viner vigorously resisted this charge and pointed out that real costs comprised all subjective costs and disutilities that were directly associated with production. He did not indicate whether he conceived of real costs in an average or marginal sense; nevertheless, most economists seemed to argue that real cost proportions referred to average cost. Viner did point out that the real cost approach took into account the fact that factors of production might not be indifferent between the same wage in different employments and might vary the quantity of leisure chosen when relative prices changed.

There are several criticisms against the real cost approach. Some were directed at its validity concerning welfare maximization; others indicated disagreements with the basic definitions of the real costs. Chipman understood by real costs "the domestic (untraded) commodities foregone in the course of producing international commodities." Kindleberger found it more meaningful.

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to use the term "opportunity cost," i.e., the cost of foregone output, rather than real costs. Then there were arguments that the real cost theory of value overlooked the question of the absence of such costs in land and also ignored the sunk character of real costs in capital. It was on account of these objections, therefore, that the opportunity cost approach enjoyed a greater recognition among economists than did the real cost theory of value.

The concept of opportunity cost was introduced into international trade theory by Haberler. In his article published in the German language in 1930, Haberler was the first to apply the opportunity cost notions extensively to international trade. The concept was a convenient first hand approach to the general equilibrium theory and, therefore, was widely accepted.

Haberler's exposition of opportunity cost focused on the construction of a production transformation or substitution curve. The supply of each factor was taken as given and the output varied depending on how the available factor supply was allocated to different optimal

productions. There was no constraint on the number or the manner in which factors were employed; however, one set of factors lay behind each transformation curve. Costs, whether total or marginal, of producing a given output were measured in terms of foregone alternative outputs and were affected by the degree to which factors could be substituted for one another. Factors of a highly specialized nature created sharply increasing opportunity costs when production of one commodity was increased. If the assumption of inelastic factor supplies was maintained and if it was further assumed that factors were indifferent as between different employments, then it could be argued that the opportunity cost approach furnished a sufficient measure of the costs of obtaining any given output.

Caves compared the real cost and the opportunity cost theories of value and pointed out that both were simplified efforts to measure subjective utilities and disutilities. The real cost approach emphasized subjective disutilities and their variations in supplying labor services among different occupations. It attempted

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to isolate each component of value, holding real income constant. The opportunity cost approach stressed the valuation of alternative choices of outputs and the role such choices played in determining the opportunity cost of different output combinations. Haberler maintained that the opportunity cost approach was an "outright income approach," as well as "a simplified general equilibrium approach." It represented an improvement over the real cost theory in the sense that it dropped the strict assumption of a single factor of production (labor) and took into account a set of factor input which might consist of any number of factors and, thus, rendered the assumption of the doctrines of comparative costs more realistic but with no change in its conclusions.

The opportunity cost doctrine, however, was not entirely free from difficulties. There were strong criticisms against the assumptions of inelastic employment of factors. It was often argued that the implicit assumption of inelastic factor supply vitiated the validity of the product transformation curve. In Figure VIII, \( \text{k} \)the production-consumption equilibrium point in the absence of trade; with the opening of trade on the terms indicated by the slope of the FF' line, G is established as the position of equilibrium in production and H that in consumption.

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8 \( \text{k} \) is the production-consumption equilibrium point in the absence of trade; with the opening of trade on the terms indicated by the slope of the FF' line, G is established as the position of equilibrium in production and H that in consumption.
FIGURE VIII

EQUILIBRIUM OF PRODUCTION AND EXCHANGE:
OPPORTUNITY COST APPROACH

the transformation curve AB constitutes a series of maximum-possible combinations of products X and Y when a certain stock of factors of production is employed. Viner asserted that in an actual situation, the product combinations would be somewhere below the curve, for the amount of factors available for employment depended on the rates of remuneration, and the equilibrium rates of remuneration could be lower than the rates which would induce each factor to offer the maximum amount of service. Furthermore, the consumption-indifference curve MM' could be understood as representing the various equal-value combinations of X and Y products only with reference to the production of oc of X and od of Y. For any other combination of products, there would be a different map of indifference curves, some of which might intersect the MM' curve. Viner, therefore, contended that NN' could not be accepted as necessarily depicting a higher level of satisfaction.

In addition, the opportunity cost theory did not support the argument that trade enabled a country to work less for the same real income rather than work the same amount of time and earn a higher return in commodities. Probably it is not meaningful to say that one approach is more general than the other; however, enough
evidence in the literature was available to conclude that the opportunity and real cost approaches were alternative simplification of the same general problem. 9

Chapter VI

Conclusion

An attempt was made in this study to trace the evolution of the neo-classical theory of international trade from its beginning with early writings of Alfred Marshall to the recent contributions of Leontief, Lerner and Meade. The basic objective of this thesis was aimed at assembling a minimum framework of the theoretical issues of the neo-classical trade theory. This, it was hoped, would shed some light on many complex international trade problems and facilitate the understanding of numerous pressing economic policy issues that arise in the broad areas of international relations.

Many new and complex international economic policy problems have frequently perplexed students of international economics due to their lack of understanding of the complex theoretical framework. It was to this inadequacy of comprehension on the part of the students of contemporary international trade theory that this study was addressed. No attempt was made to minimize the complexities of the theoretical problems and issues in
international economics. Instead, efforts were made to carefully analyse and clearly identify these issues. This thesis would well serve its purpose if it would give to the student of international economics necessary analytical tools to understand unmistakably the nature and the effects of alternate economic policies in the field of international economic relations.
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