RICARDO'S THEORY OF INTERNATIONAL BALANCE OF PAYMENTS EQUILIBRIUM[1]

By KIYOSHI KOJIMA
Assis. Professor of International Economics

I. *Introduction*

In the treatises on international trade, David Ricardo is quite famous for his illustration of Comparative Costs, but the other points in his foreign trade theory have been neglected or misunderstood. It is said that Ricardo does not indicate how the actual terms of trade can be determined between the ratios of comparative costs, which set the limits within which the terms of trade must lie, and that John Stuart Mill first supplemented the defects of Ricardo's theory by his law of Reciprocal Demands.[2] It seems to me, however, that Ricardo deserves credit for his unique theory of international balance of payments equilibrium, which may be called "cost theory" or "wage-change theory" in comparison with Mill's "demand theory" of international equilibrium. It is therefore my first task to dig out Ricardo's undiscovered theory of international balance of payments equilibrium.

We may find some confused systematization between what is called the theory of international values and the theory of transfer mechanism; though in the former Mill is said to have developed the Ricardian theory, in the latter, Ricardo and Mill are not recognized as being on the same footing, i.e., Ricardo is an antecedent of the modern theory and Mill's is the classical theory.[3] To me there should not be any difference between the two mechanisms which were developed by the same author, and it is my second purpose of this paper to find out Ricardo's uniform mechanism which may be applied to international equilibrium as well as to the transfer process. Then, Ricardo's mechanism may correctly be classified as the

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[2] *Cf.* J. S. Mill, *Essays on Some Unsettled Questions of Political Economy* (London, 1844), p. 5; G. Haberler, *Theory of International Trade* (London, 1936), p. 145; J. Viner, *Studies in the Theory of International Trade* (New York, 1937), p. 446.

[3] *Cf.* J. Viner, *Canada's Balance of International Indebtedness, 1900-1913* (Cambridge, 1924), pp. 191-206; C. Iversen, *Aspects of the Theory of International Capital Movements* (Copenhagen, 1936), Part II.

classical theory and Mill's as the modern theory.

In order to analyse the mechanism of international equilibrium or transfer, we must distinguish between two different adjustments: (a) adjustments in individual transactions, or, in brief, individual adjustments, and (b) adjustments in national economy as a whole or over-all adjustments. Every transaction in foreign trade is carried on by the merchant for profit under given conditions of the rate of exchange, wage levels, rates of interest, etc. As a result of individual transactions, the balance of trade, or the balance of payments, produces a specific situation, the adjustment process, if there remains any disequilibrium, being first stimulated by a change of the parameter such as exchange devaluation or wage cuts, the effect of which is not restricted to export industries or some branches of industry but to the national economy as a whole on its income earning side as well as on its income spending side. After this over-all adjustment, individual actions under the new parameter come into force, and the international equilibrium will be recovered.

The over-all adjustment is quite complicated and differs in accordance with the economic conditions of a nation and foreign countries, i.e., whether the nation and the foreign countries are progressive or declining, are operating at full employment or under-employment, and whether money wages and the monetary system are rigid or flexible, etc. The most fundamental differences among doctrines on international equilibrium and transfer mechanism may arise from how each author envisages and explains this over-all adjustment. For example, the Quantity Theory of money, which is the fundamental premise of the "specie-movements-price-change" mechanism, is a method of explaining the over-all adjustment, and the multiplier analysis of the Keynesian theory is another, each of which, though excellent, is rather too simplified and one-sided. What kind of over-all adjustment is Ricardo thinking of?

In Ricardo's *Principles* (ed. by Gonner), Chapter 7, we find those two distinct problems of individual and over-all adjustments. § 46 of Chapter 7 explains how foreign trade affects the national economy as a whole, and § 47, where the principle of comparative costs is developed, explains the effects of foreign trade on the relative value of commodities. Hence, it can be said, the latter relates to the problem of individual adjustment and the former to that of over-all adjustment. And Ricardo analyses in §§ 48–50 the mechanism of international equilibrium not under a barter system, but under a monetary one, and in §§ 51–53 the same questions as in § 47 are being analysed in monetary terms.[4] It seems important that

[4] B. Ohlin points out the following; "It is often suggested that Ricardo left the theory there and that Mill added the equilibrium analysis through his equation of reciprocal demand. As a matter of fact, however, Ricardo (*Principles*, §§ 51-52, ed. Gonner) presented a penetrating analysis of international price relations, where this equation is really tacitly assumed to exist. There is nothing in this analysis which cannot be easily fitted into a mutual interdependence theory." *Interregional and International Trade* (Cambridge, 1933), p. 586, foot-note 1.

Ricardo has adopted a monetary system, the reason for which is that overall adjustment can only be well explained by the adoption of a monetary system, and herein we may find Ricardo's unique theory of international equilibrium.

II. *Individual Adjustments of Foreign Trade*

1. The Link Between National Value Systems.

International trade consists, of course, of transactions between nations which have a unique and different system of value (or cost-price structure) from each other. Therefore, we must, first of all, find the link of these independent value systems, which is the par value of gold or the rate of exchange and is a given condition for individual transactions. The par value of gold or the rate of exchange are, in appearance, the monetary medium connecting national value systems, and they may therefore be called the monetary link. But they play an even more fundamental role as the real link, or a link in real terms. With the premise that free competition prevails inside a country, workers of equal qualification receive equal wages and the rate of profit becomes equal, and a unit of money, or gold which has a fixed relation to money, can buy or control an equal quantity of labour. In international economy with no premise of movement of labour and capital, a unit of money or gold of a nation cannot control an equal quantity of labour of other nations but different quantities in proportion to efficiency of production. The par value of gold or the rate of exchange is a real link between national value systems in such unequal exchange ratio of labour, which is called by Professor Viner the factoral terms of trade.

We may easily find this idea in Ricardo's work. First, what is the value of gold ?

> "Gold and silver, like all other commodities, are valuable only in proportion to the quantity of labour necessary to produce them, and bring them to market. Gold is about fifteen times dearer than silver, not because there is a greater demand for it, not because the supply of silver is fifteen times greater than that of gold, but solely because fifteen times the quantity of labour is necessary to procure a given quantity of it."[5]

Second, the value of gold (i.e. its labour cost of production or the cost of bringing it to market) is the intrinsic value of money. The purchasing power of money or the general price level may fluctuate temporarily according to the quantity of money, but, as Ricardo says, "The quantity of money that can be employed in a country must depend on its

[5] David Ricardo, *Principles of Political Economy and Taxation*, ed. by E. C. K. Gonner (London, 1913), p. 340.

value"[6] (the value being the labour cost of gold which is contained in a unit of money), and "A currency is in its most perfect state when it consists wholly of paper money, but of paper money of an equal value with the gold which it professes to represent."[7] In other words, the purchasing power of money gravitates towards and coincides ultimately with the value of gold, the reason lying in "the principle of limitation of quantity (of money)"[8] and the perfect liberty of gold movement.[9] To clarify this mechanism is the very purpose of this paper.

Third, the rate of exchange is ascertained "by estimating the value of the currency of one country, in the currency of another,"[10] i.e., the ratio of gold quantity which is contained in a unit of money in various countries, or the ratio of intrinsic value of money, is the rate of exchange.

And lastly, we can easily find the real exchange ratio of labour quantities between nations through the rate of exchange multiplied by the quantity of labour necessary to obtain a unit of money, and the real factoral terms of trade should be equal as to various international goods, except for the cost of transport and trade barriers, if perfect competition prevails within each trading nation.

2. Comparative Costs Including Gold—A Table of Comparative Rates of Profit Measured by Gold.

As the value of money is synonymous with the value of gold and gold is also a kind of commodity, Ricardo considers, I believe, a table of comparative costs including gold. We assume that to produce 1 gram of gold may require the labour of 100 men for one year in England and that of in 80 men Portugal. Adding this fact to Ricardo's illustration, which is based on two commodities, cloth and wine, we obtain Table 1-*a*.[11]

Table 1-*a*

	England	Portugal
Cloth	100 men	90 men
Wine	110 men	80 men
Gold	100 men	80 men

Table 1-*b*

	England	Portugal
Cloth	1.0	1.125
Wine	1.1	1.0
Gold	1.0	1.0

Table 1-*c*

	England	Portugal
Cloth	£$_1$ 45	£$_2$ 50
Wine	£$_1$ 50	£$_2$ 45
Gold	£$_1$ 45	£$_2$ 45

If we take the value of gold as yardstick, Table 1-*a* may be transformed

[6] *Ibid.*, p. 340.
[7] *Ibid.*, p. 349.
[8] *Ibid.*, p. 431.
[9] *Ibid.*, p. 345.
[10] *Ibid.*, p. 128.
[11] I have slightly modified Ricardo's famous illustration of the side of the cost of English wine from 120 men to 110 men. The insertion of gold into the table of comparative costs is similar to that of "*c*-goods" by H. v. Mangoldt in his *Grundriss der Volkswirtschaftslehre* (Stuttgart, 1863).

to Table 1-*b*, which indicates the ratio of relative values in each country or the absolute prices of cloth and wine in terms of gold. Thus, if English merchants export cloth to Portugal, they may get at first 1.125 gold, i.e. 12.5 per cent extra profit in terms of gold, and Portuguese merchants, if they export wine to England, may also get 10 per cent. So we may call Table 1-*b* "comparative rates of profit," which is another expression of "comparative costs," but closer to the businessman's way of looking at things. Such a profit comparison is the actual motive of individual foreign trade transactions. The following statement of Ricardo will be well understood by what has been illustrated in Table 1-*b*.

> "Thus, cloth cannot be imported into Portugal, unless it sell there for more gold than it costs in the country (England) from which it was imported; and wine cannot be imported into England, unless it will sell for more there than it costs in Portugal." [12]

Next, we assume that one unit of English standard money ($£_1$) contains 1/45gram of gold and Portuguese money ($£_2$) also contains 1/45 gram, consequently the rate of exchange is at par value of $£_1 1 = £_2 1$. The intrinsic value of English money is $\frac{100}{45} = 2.2$ men or the money wage of an English worker is $£_1 0.45$, and in Portugal the former will be $\frac{80}{45} = 1.8$ men and the latter $£_2 0.555$. We call this assumption "parameter α" of money-value–money-wage.

Converting Table 1-*a* or 1-*b* by means of this "parameter α" we obtain Table 1-*c*, which illustrates Ricardo's following statement:

> Thus, suppose before the improvement in making wine in England, the price of wine here were £50 per pipe, and the price of a certain quantity of cloth were £45, whilst in Portugal the price of the same quantity of wine was £45, and that of the same quantity of cloth £50, wine would be exported from Portugal with a profit of £5 and cloth from England with a profit of the same amount." [13]

Ricardo's explanation of the mechanism of international equilibrium does not start from Table 1 but from Table 2, which is the new comparative cost after the improvement in making wine in England, the labour

Table 2-*a*

	England	Portugal
Cloth	100 men	90 men
Wine	100 men	80 men
Gold	100 men	80 men

Table 2-*b*

	England	Portugal
Cloth	1.0	1.125
Wine	1.0	1.0
Gold	1.0	1.0

Table 2-*c*

	England	Portugal
Cloth	$£_1$ 45	$£_2$ 50
Wine	$£_1$ 45	$£_2$ 45
Gold	$£_1$ 45	$£_2$ 45

[12] D. Ricardo, *op. cit.*, pp. 117-118.
[13] *Ibid.*, pp. 118-119.

cost of which falling from 110 men to 100 men and its natural price from £$_1$50 to £$_1$45.[14] Table 2-*c* is of course made by using "parameter α." When the situation is such as Table 2-*c*, individual transactions may result in a favourable balance of trade to England, as explained by Ricardo as follows:

> "Every transaction in commerce is an independent transaction. Whilst a merchant can buy cloth in England for £45 and sell it with the usual profit in Portugal, he will continue to import it from England. His business is simply to purchase English cloth, and to pay for it by a bill of exchange, which he purchases with Portuguese money. It is to him of no importance what becomes of this money: he has discharged his debt by the remittance of the bill. His transaction is undoubtedly regulated by the terms on which he can obtain this bill, but they are known to him at the time; and the causes which may influence the market price of bills, or the rate of exchange, is no consideration of his."[15]

Here, Ricardo mentions clearly that what becomes of the rate of exchange is an over-all adjustment and consequently is of no importance to individual transactions. As a result of English an export surplus, an exchange bill on England obtains a premium, and finally the rate of exchange of the £$_1$ would be forced up to the Portuguese gold export point and gold would be exported from Portugal to England.[16]

3. The Cause of Gold Movement.

Why would gold be exported from Portugal to England? To this question, Ricardo would have answered thus: its cause is none other than the profit-seeking motive of individual merchants. Owing to this motive, Portuguese merchants import only English cloth and export no wine. When the rate of exchange of the £$_1$ is forced to Portuguese gold export point, it makes no difference to Portuguese merchants whether to buy exchange bills on England or exchange £$_2$ for gold at a Portuguese bank and send such gold to England, and they would thus export gold to pay for imports.

In other words, gold would be exported or imported according to whether gold, like other commodities, has superior advantage or inferior advantage in the table of comparative costs. In Table 2-*a*, Portuguese gold, as well as wine, has superior advantage or its relative value is comparatively cheap, and can thus be exported. Such Ricardo's use of the terms "relative redundancy of money" or "relative cheapness of money" should be understood in this way. And there is the "cost principle" of Ricardo, which means that the division of trade, balance of trade and gold movement are at the same time determined only by the profit-seeking actions of merchants who well recognise the comparative costs.

In such a way we may understand clearly the following famous words

[14] *Ibid.*, p. 119.
[15] *Ibid.*, p. 119.
[16] *Ibid.*, p. 119.

by Ricardo in his discussion with Malthus:

> "If we consent to give coin in exchange for goods, it must be from choice, not necessity. We should not import more goods than we export, unless we had a redundancy of currency, which it therefore suits us to make a part of our exports. The exportation of the coin is caused by its cheapness, and is not the effect, but the cause of an unfavourable balance: we should not export it, if we did not send it to a better market, or if we had any commodity which we could export more profitably." [17]

In the case of tribute payment, this begins from an increased demand for exchange bills on a foreign country, and the succeeding processes of transfer are the same. And in the case of a bad harvest, the adjustment process of the balance is the same as an improvement in production, because the bad harvest brings on a rise, though contrary to the improvement, of the natural value of corn.

I shall not try here to compare too rigorously this idea of Ricardo on the cause of the gold movement with those of Thornton, Malthus and J. S. Mill, but it is clear that the latter three emphasized the importance of a change in import-demands, and have misunderstood Ricardo's way of thinking.

III. *Over-all Adjustments of National Economy*

4. The Effect of Gold Movement.

Now what resultw ill be brought about by the gold movement from Portugal to England? Though gold is exported or imported as a kind of commodity, the incoming or outgoing gold may have or was actually used as money. The over-all adjustment of the national economy on both sides to recover the balance of trade will start from the increase, in England, and the decrease, in Portugal, of the quantity of gold and money which may bring forth the following price change.

> "But the diminution of money in one country, and its increase in another, do not operate on the price of one commodity only, but on the prices of all, and therefore the price of wine and cloth will be both raised in England, and both lowered in Portugal. The price of cloth, from being £45 in one country and £50 in the other, would probably fall to £49 or £48 in Portugal, and rise to £46 or £47 in England, ..." [18]

If we assume, as nearly as possible Ricardo's illustration, that the general prices of all commodities, including gold, in England will rise by one-thirtieth and in Portugal fall in the same proportion, we may obtain Table 3. Meanwhile money wages may change in the same ratio as general prices,[19]

[17] D. Ricardo, High Price of Bullion, in *Economic Essays*, ed. by Gonner (London, 1923), p. 11.

[18] D. Ricardo, *Principles...*, *op. cit.*, p. 120.

[19] *Cf.* "...the money price of wages will rise, but if it be in consequence of the fall in the value of money, not only wages and corn, but all other commodities will rise" (*ibid.*, p. 127).

i.e., they may rise in England from £$_1$0.45 to £$_1$0.465 and decrease in Portugal from £$_2$0.555 to £$_2$0.54. These changes in general prices and

Table 3

	England	Portugal
Cloth	£$_1$ 46.5	(£$_2$ 48.3)
Wine	(£$_1$ 46.5)	£$_2$ 43.5
Gold	(£$_1$ 46.5)	£$_2$ 43.5

money wages mean the intrinsic (labour-cost) value of money have dropped in England from 2.2 men to $\frac{100}{46.5}$ = 2.15 men and have risen in Portugal from 1.8 men to $\frac{80}{43.5}$ = 1.84 men. We call these new structures of money-value–money-wage "parameter β". As long as gold movement is permitted freely, the rate of exchange will be kept at par value (£$_1$1= £$_2$1), or at least within gold points.

From Table 3, it is clear that merchants in both countries will have an incentive to export to each other, though the trade in Table 2 is unilateral.

In these mechanisms, there occurred no change in natural value, which remains the same as in Table 2-*a*, and in relative value, which remains the same as in Table 2-*b*, but the only change is that of the natural prices in each country, as Ricardo states:

> "Foreign trade, then, whether fettered, encouraged, or free, will always continue, whatever may be the comparative difficulty of production in different countries; but it can only be regulated by altering the natural price, not the natural value, at which commodities can be produced in those countries, and that is effected by altering the distribution of the precious metals." [20]

The alteration of the natural price, not natural value, in both countries means the change of "parameter" from α to β, which equals the change in the factoral terms of trade from 2.2 English vs. 1.8 Portuguese to 2.15 vs. 1.84, i.e., it changes unfavourably to Portugal from 1 to $\frac{1}{1.07}$. This change in the factoral terms of trade is the fundamental element in the over-all mechanism of international equilibrium.

How has the change in the factoral terms of trade been occasioned? Ricardo explains it, as mentioned above, by the proportionate change in prices and money wages. This idea is of course the result of the Quantity Theory of money. This idea, is it not a true classical theory? The explanation of over-all adjustment by the Quantity Theory, however,

[20] *Ibid.*, p. 330.

cannot be denied to be too simple, and should better be supplemented by Professor Harrod's elaboration. "The inflow of gold makes the situation of capitalists on balance more liquid. That same increase of liquidity which drives them to seek more profitable channels of investment may also stimulate investment at home, by making the conditions of borrowing more easy."[21] Increased investment will set up keener competition for the means of production, especially for labour, the result of which raises industrial costs and so reduces exports.[22] It is important to understand that, in the meantime, until the gold inflow reaches the rise of prices, there happen many real changes both on production and on income spending side, and at least there arises the increase in investment, the volume of employment or money wages prior to the rise of prices.

By the way, Ricardo considers not only the short-run process of adjustment by the Quantity Theory as mentioned and interpreted above in the light of Professor Harrod, but also the dynamic or long-run effect of foreign trade. We may recognize the inflow of gold by the improvement in some industry as the increase of capital accumulation,[23] which may, in accordance with the Wage Fund theory, raise the market rate of wages. This would, in accordance with Malthusian doctrine, produce a population increase. By the law of diminishing returns, the corn price will rise and the natural rate of wages will coincide with the market rate. Consequently, the real profit per unit of capital would fall. Foreign trade, through the importation of cheap corn, is a remedy, as it prevents the rate of profit and capital accumulation from falling.

Ricardo distinguishes rigorously two lines of changes : one is the short-run or static change which is the change of natural price, and the other is the long-run or dynamic change which is the change of natural value. How these two changes are interrelated is a problem. However, even in the short-run adjustment, as Professor Harrod recognizes, we must also see clearly the wage change through the increase or decrease in investment,[24] which is not clearly explained by the Ricardian Quantity Theory approach.

5. Adjustment by the "Competition of Commerce."

Subsequent to, or simultaneously with, the change of natural prices,

[21] R. F. Harrod, *International Economics*, revised ed. (London 1939), p. 140.

[22] *Ditto.*

[23] Ricardo mentions that the improvement in production of English wine is "a real advantage" (Ricardo, *op. cit.*, p. 118) to England distinguishing it from "a seeming advantage" (p. 122) to Portugal, because, "Estimated in money, the whole revenue of Portugal would be, diminished ; estimated in the same medium, the whole revenue of England would be increased" (p. 122).

[24] The difference of the conclusion between Ricardo and Professor Harrod comes from their premises on employment. In Ricardo a condition of full employment being assumed, the increase of investment will result in a rise of wages, but in Professor Harrod a condition of under-employment being assumed, it will produce an only increase of employment.

there occurs another over-all adjustment, the change of relative (natural) values of commodities through importation. This adjustment is made by the internal competition between industries, which Ricardo called "the competition of commerce." [26]

As the prices in Table 1-*c*, 2-*c* and 3 should be seen as "natural prices," the difference in prices of the same commodities of the two countries is the extra profit which exporters or importers might obtain. So long as this extra profit may be obtained by foreign trade, "capital would naturally flow into this advantageous trade," [26] and the increase in capital and competition in this trade would reduce its rate of profit to the general rate. This means that the price of an imported commodity would eventually fall to the natural price of the exporting country. Ricardo continues in the above-quoted paragraph, "till the fall of the price of wine (imported commodity to England) had brought everything to the former level" [27] ("everything" pointing to the rate of profit). More clearly Ricardo mentions the change in price of imported commodities as follows.

> "Corn, like every other commodity, has in every country its natural price, viz., that price which is necessary to its production, and without which it could not be cultivated: it is this price which governs its market price, and which determines the expediency of exporting it to foreign countries. If the importation of corn were prohibited in England, its natural price might rise to £6 per quarter in England, whilst it was only at half that price in France. If at this time, the prohibition of importation were removed, corn would fall in the English market, not to a price between £6 and £3, but ultimately and permanently to the natural price of France, the price at which it could be furnished to the English market, and afford the usual and ordinary profits of stock in France; and it would remain at this price, whether England consumed a hundred thousand, or a million of quarters. If the demand of England were for the latter quantity, it is probable that, owing to the necessity under which France would be, of having recourse to land of a worse quality, to furnish this large supply, the natural price would rise in France; and this would of course affect also the price of corn in England. *All that I contend for is, that it is the natural price of commodities in the exporting country, which ultimately regulates the prices at which they shall be sold, if they are not the objects of monopoly, in the importing country.*" [28]

In these remarks we can see Ricardo's thoroughgoing idea: (1) the price of commodities is ultimately governed by the natural price or cost of production, (2) the demand is a given condition and affects only the quantity and the cost at which the commodity be produced, (3) what determines the expediency of exporting or importing certain commodities is the comparative costs of production, and (4) the price of imported commodities

[25] Ricardo, *op. cit.*, p. 117.
[26] *Ibid.*, p. 109.
[27] *Ibid.*, p. 109.
[28] *Ibid.*, pp. 363-4. The italics are mine.

may ultimately fall to the natural price of the exporting country.

A price reduction might happen not only to English wine and Portuguese cloth but also to gold of England. If so, we obtain Table 4–*c*, and the rate of exchange may recover its par value. Table 4–*c* is equivalent to

Table 4–*a*

	England	Portugal
Cloth	100 men	86 men
Wine	93 men	80 men
Gold	93 men	80 men

Table 4–*b*

	England	Portugal
Cloth	1.07	1.07
Wine	1	1
Gold	1	1

Table 4–*c*

	England	Portugal
Cloth	£$_1$ 46.5	(£$_2$ 46.5)
Wine	(£$_1$ 43.5)	£$_2$ 43.5
Gold	(£$_1$ 43.5)	£$_2$ 43.5

Table 4–*b*, the ratio of relative values in each country which becomes the common ratio, and there remains no extra profit in foreign trade compared with home industries. This is a condition, necessary but insufficient, of international equilibrium. The other condition is that, during the period of the two adjustments mentioned above, the value exported and imported in terms of gold must be equal, and if the balance of trade is not yet be recovered, the same adjustment processes are repeated.[29] In short, a common ratio of relative values in both countries by which the balance of trade

[29] We have simplified the process of change from Table 2-*c* to Table 3 and to Table 4-*c*, but the actual adjustment may be step-by-step changes as follows.

In Table 2-*c*, Portugal has an import-surplus, and the rate of exchange will be favourable to England, for example 1%, to the Portuguese gold export point, then we may obtain Table 5-*a*. This difference of the gold price in both countries will stimulate gold exports from Portugal to England. When gold moved, as explained in Section 4, the general price may change on the one hand, and on the other, as explained in Section 5, prices of imported commodities (now gold) may fall, and the situation is like that of Table 5-*b*.

Table 5-*a*

	England	Portugal
Cloth	£$_1$ 45	£$_2$ 50
Wine	£$_1$ 45	£$_2$ 45
Gold	£$_1$ 45.45	£$_2$ 45

Table 5-*b*

	England	Portugal
Cloth	£$_1$45.45	£$_2$ 49.5
Wine	£$_1$45.45	£$_2$ 44.55
Gold	(£$_1$44.55)	£$_2$ 44.55

Table 5-*c*

	England	Portugal
Cloth	£$_1$45.45	(£$_2$45.45)
Wine	(£$_1$44.55)	£$_2$44.55
Gold	(£$_1$44.55)	£$_2$44.55

Now, not only cloth may be exported from England to Portugal but also wine can be exported from Portugal to England and the prices of imported commodities on each country may fall as in Table 5-*c*. Such is the first change which has occurred by the movement of some small quantity of gold, but, if the quantity is not sufficient to cover the balance of trade, another step of similar change may occur recurrently. Ricardo says "...the exchange can only be at par, when a sufficient quantity of money is introduced into the country excelling in manufactures, so as to raise the price of its corn and labour" (*op. cit.*, p. 127).

In such a way, not as in Table 3, neither the prices of English wine and gold rise to £$_1$ 46.5 nor the price of Portuguese cloth fall to £$_2$ 48.3 (these price changes being supposed or used only to explain the over-all adjustment as separated from the individual adjustment), but ultimately may reach the situation expressed by Table 4-*c*.

can be attained is a necessary and sufficient condition of international equilibrium.

Converting Table 4-*c* or 4-*b* by means of "parameter β" we obtain Table 4-*a*. Here, not only the relative values of cloth, wine and gold in each country are the same, but also the factoral terms of trade between countries reach to English 100 vs. Portuguese 86 ($\fallingdotseq 93 : 80$) for every commodity.[30] It is a clear expression of the difference in national productivity, "real rewards of the labourer"[31] or "the comparative value of money in different countries of the world."[32]

In short, the international equilibrium and the commodity terms of trade, according to Ricardo, depend on the quantity of export goods in both countries which are produced and supplied to the foreign countries by the re-investment of capital to the export industry from other industries until the extra profit vanishes, viz. until the comparative costs attain a common ratio of costs. We cannot deny that the change in demand side plays an important role in this process, but, in Ricardo, it affects only the scale and cost of production. And, if production is expanded by increasing costs, the expansion will also be an accelerating, but individual process of adjustment which leads to a common ratio of costs.[33] This kind of process might naturally be included in Ricardo's conception of "the competition of commerce." Consequently, we may rightly consider Ricardo's mechanism of international equilibrium as "cost theory" or "wage-change theory," and, at the same time, it can safely be classified as the classical theory, because it necessarilly includes the unfavourable change in terms of trade (commodity and factoral) for the import surplus recovering or capital exporting country. Comparing Ricardo's theory, Mill's Law of Equation of Reciprocal (or International) Demands constitutes a problem. If the law means that exports and imports must balance, it is merely a truism. And if the law contends that equation must be established only by the change of import demand in both countries through the price-effect or the

Table 6

	England	Portugal
Cloth	£1 45	£2 48.2
Wine	£1 42.1	£2 45
Gold	£1 45	£2 45

[30] In the case of exchange devaluation or appreciation, i.e., "whenever the current of money is forcibly stopped, and when money is prevented from settling at its just level" (pp. 127-128), the result makes no difference. The rate of exchange would go from par to £1 1 = £2 1.07, which is equal to an unfavourable change for Portugal in factoral terms of trade. The prices of cloth and wine would be the same, as in Table 6, in both countries, converted by the new rate of exchange. The real price of gold, however, differs in both countries because the gold movement is forcibly stopped. If we convert Table 6 by means of "parameter α," we obtain Table 4-*a*, but excluding gold.

[31] *Ibid.*, p. 123.

[32] *Ibid.*, p. 126.

[33] *Cf.* Professor Harrod's elucidation of international equilibrium in the first half of his *International Economics*.

income-effect, his mechanism is clearly different from Ricardo's. We therefore recognize Mill's mechanism as "demand theory," the details of which, however, may be studied on another occasion.

IV. *A Diagrammatical Representation*

Ricardo's mechanism of international equilibrium explained above may well be represented by a diagram. In Figure 1, on the lower horizontal axis is indicated the number of Portuguese labour and on the left hand vertical axis is the number of English labour. The distance of OW or OC is the cost of wine and cloth in Portugal and the distance of Ow or Oc their cost in England, in terms of respective labour. The lines Ot_1, Ot_2, ... represent the factoral terms of trade or the international ratio of efficiency reward in terms of gold. We thus obtain points •, ○, △ and × where the Ot line intersects the lines WW', CC', ww' and cc'. These points indicate the prices in terms of gold of Portuguese wine, Portuguese cloth, English wine and English cloth, respectively, the horizontal distances from the left hand vertical axis to these points being the prices for Portugal and the vertical distances from the lower horizontal axis the prices for England.

(1) If the factoral terms of trade are Ot_1, the gold prices of English wine and cloth would be lower than the Portuguese for England as well as for Portugal. Both commodities will then be exported from England to Portugal (i.e., complete unilateral trade), and gold will be exported in the reverse direction. Consequently, the factoral terms of trade will change to Ot_2. (2) Under the factoral terms of trade Ot_2, the gold price of English cloth is lower than Portuguese cloth for both countries, so it will be exported from England to Portugal, but the gold price of English wine is equal to Portuguese wine, as at the point a; so it may not be traded (i.e., unilateral trade), and gold will be exported from Portugal to England (this situation is illustrated by Table 2). Consequently, the factoral terms of trade will change to Ot_3. (3) If the factoral terms of trade become Ot_3, the gold price of wine is lower in Portugal (point e in Figure 1) than in England (point g), and that of cloth is lower in England (point d) than in Portugal (point f), so bilateral export may occur (as illustrated in Table 3). The distances, vertically for England and horizontally for Portugal, of e and g, or d and f, are the extra profit in foreign trade in terms of gold. The gold price of English wine and Portuguese cloth will fall to the gold prices in the exporting country (to points e and d) respectively, through importation, the international price of each commodity may become equal in terms of gold, and the extra profit may vanish. This equilibrium may be attained through "competition in commerce," as explained with refer-

ence to Table 4.

When the process begins from the factoral terms of trade Ot_5, the explanation is the same as mentioned above, and the equilibrium will also be set up as under Ot_3. The limits, within which factoral terms of trade lie,

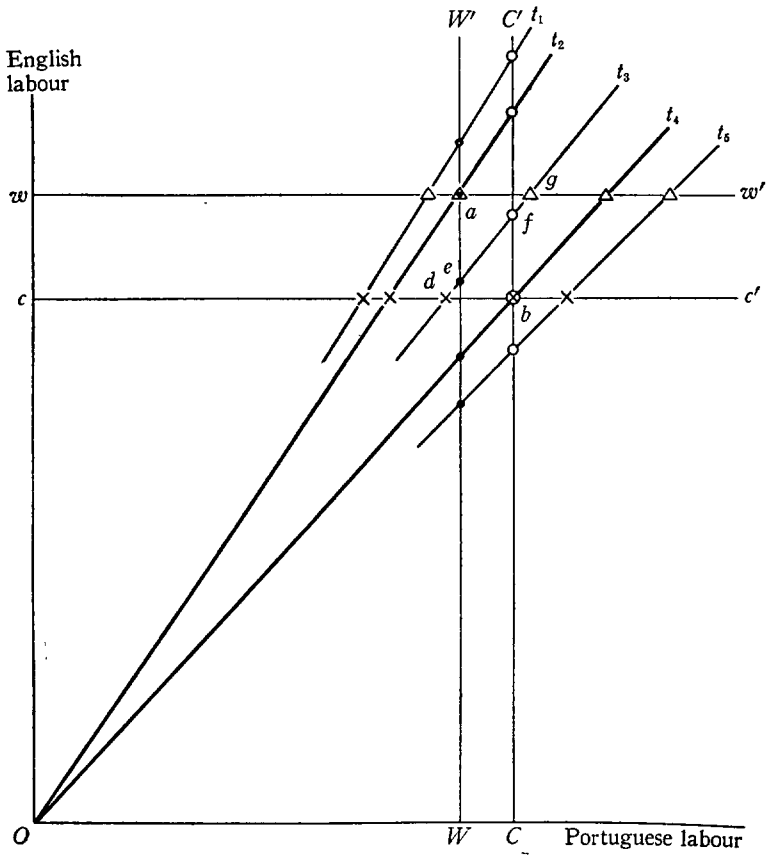

Fig. 1

are of course Ot_2 and Ot_4. Such a condition of Ot_1 or Ot_5 is not unthinkable, especially under what is called " the fundamental disequilibrium" in the post-war period.[34]

This diagrammatical illustration can be carried out in another way. In Figure 2, on the lower horizontal axis is indicated the price of cloth in

[34] Ricardo points out: "Of these two countries, if one had the advantage in the manufacture of goods of one quality, and the other in the manufacture of goods of another quality, there would be no decided influx of the precious metals into either; but if the advantage very heavily preponderated in favour of either, that effect would be inevitable" (*op. cit.*, p. 123).

terms of gold and the left hand vertical axis is the price of wine in terms of gold. The line OE represents the relative values of wine and cloth in England and the line OP those in Portugal, both lines representing comparative costs. The relation between e_1, e_2, e_3, . . ., on the line OE, and p_1, p_2, p_3, . . ., on the line OP, represents the factoral terms of trade or the international ratio of efficiency reward in terms of gold. Thus, (1) if the factoral terms of trade are $e_1 : p_1$, the gold prices of English cloth (Oc_1

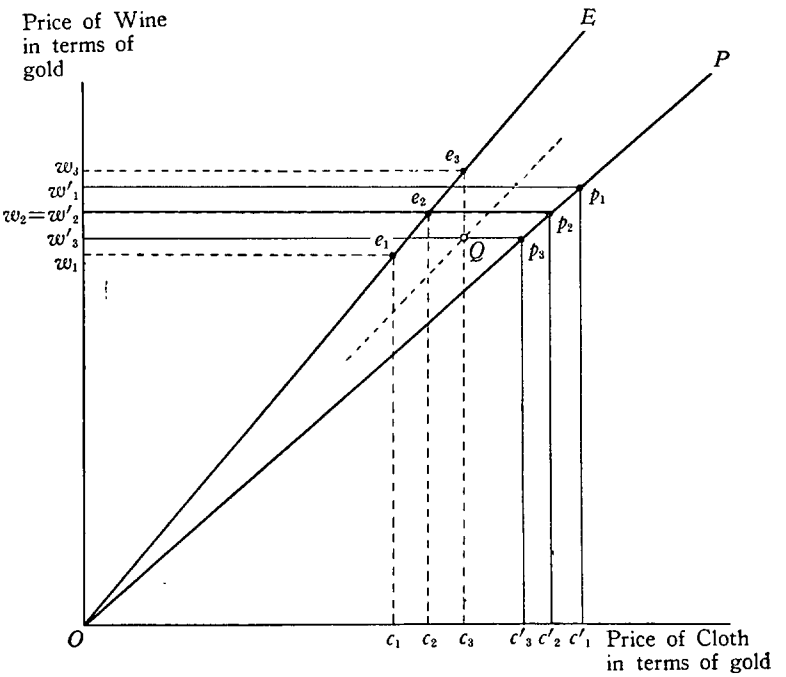

Fig. 2

in Figure 2) and English wine (Ow_1) are lower than the Portuguese prices (Oc_1' and Ow_1', respectively). Consequently, the factoral terms of trade will change to $e_2 : p_2$ through the rise of the gold price and of wages in England and a fall in Portugal, the process and causality of which are the same as mentioned above. (2) Under the factoral terms of trade $e_2 : p_2$, the gold price of English cloth (Oc_2) is lower than that of Portuguese cloth (Oc_2'), but the gold price of wine is equal in both countries ($Ow_2=Ow_2$'). (3) If the factoral terms of trade become $e_3 : p_3$, the gold price of wine will be lower in Portugal (Ow_3') than in England (Ow_3), and that of cloth the opposite (i.e., Oc_3 is lower than Oc_3'). International equilibrium may be set up under the commodity terms of trade OQ, if exports in both countries

are equalized, when an extra profit in foreign trade, i.e., the distance e_3Q and p_3O, have vanished through internal competition. At equilibrium the prices of English wine and Portuguese cloth will fall to the prices of respective export country, i.e., the former may fall from Ow_3 to Ow_3' and the latter from Oc_3' to Oc_3.

The two methods of diagrammatical representation are of course on the same footing, but the first method is applicable to the multi-commodities (but of two countries), and the second to the multi-countries (but trading in two commodities).

The core of these two methods is that (a) the change of the factoral terms of trade is the fundamental element in the mechanism of international equilibrium and narrows the limits within which the equilibrium and the commodity terms of trade will be determined, and (b) inter-industrial competition within each country will determine the actual equilibrium and the commodity terms of trade. As Ricardo's analysis and our figures represent only the international equilibrium of the cost-price sturcture,[35] we must add another figure which explains the variation in the amount of export-supply or of import-demand. The latter may be drawn after the critical reconsideration on the Mill-Marshallian analysis has been completed. But a word of caution is perhaps in order at this point that the Mill-Marshallian analysis, especially the analysis which uses the reciprocal demand curves, forgets so often the importance of international equilibrium of the cost-price structure.

V. *Conclusion*

This paper has tried to trace Ricardo's well-known proposition:

> "Gold and silver having been chosen for the general medium of circulation, they are, by the competition of commerce, distributed in such proportions amongst the different countries of the world, as to accommodate themselves to the natural traffic which would take place if no such metals existed, and the trade between countries were purely a trade of barter." [36]

To the "natural traffic" or to "trade of barter," we can only reach through the mechanism of international equilibrium examined above.

The mechanism is, in brief, as follows:

(1) Individual profit-seeking transactions of foreign trade are carried out on the basis of comparative costs, and these individual calculations determine the international division of labour, the lines of foreign trade, the fluctu-

[35] The diagrammatical representation of Mangoldt's treatise is also said to be representing only the international relation of the cos t-price structure. See, J. Viner, *Studies . . . , op. cit.*, p. 459, Chart VIII, and p. 465, Chart IX.

[36] Ricardo, *op. cit.*, p. 117.

ation of exchange rates and the movement of gold.
(2) The over-all adjustment of the link, monetary and real, between the different value-systems may occur through a change of wages and prices as a result of gold movements or through variations of exchange rates.
(3) Through inter-industrial competition, the rate of profit may become equal within the national economy, and, consequently, commodities are exported and imported at the natural price of the exporting country, which price is of course cheaper for the importing country than before opening the trade.

It is evident that Ricardo's characteristics lie in his thoroughgoing "real-cost principle" or the "competition of commerce principle."

The immediate or static gain from foreign trade is not to "increase the amount of value," because foreign trade does not directly affect the amount of capital and labour of a nation but merely introduces a better redistribution of them, but to "increase the mass of commodities, and therefore the sum of enjoyment,"[37] in other words, the fall of relative prices in the imported commodities (as well as gold, if imported). As regards the indirect or dynamic effects of foreign trade, there remain many problems. Ricardo himself says: (1) cheapening of the commodities through importation diminishes expenditure and consequently affords insentives to saving and to the accumulation of capital, (2) "by the extension of foreign trade, or by improvements in machinery, the food and necessaries of the labourer can be brought to market, at a reduced price, profits will rise,"[38] and (3) foreign trade will change the distribution of national income.[39]

We have limited our analysis to the mechanism of international equilibrium, but we have to reconsider Ricardo's view on the gain, especially the dynamic gain, from foreign trade with reference to this paper.

[37] *Ibid.*, p. 108.
[38] *Ibid.*, p. 112.
[39] *Ibid.*, p. 256.