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IMPERFECT COMPETITION

IN

INTERNATIONAL TRADE

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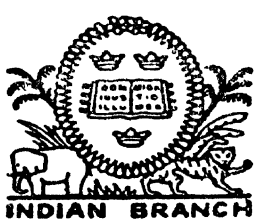

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FOREWORD

MONOPOLISTIC or quasi-monopolistic forces are gaining increasing strength over a large area of modern industrial enterprise. This 'monopoly complex' is not confined to domestic trade but has as well invaded the sphere of world trade. The contours of world trade are drifting away from the free trade pattern, and it is appropriate to study to what extent and in what respects the traditional theory on the subject needs revision. Dr. Rangnekar's aim in this book is to restate the pure theory of international trade so as to bring it in line with the recent work on monopoly and imperfect competition. The study is thus an extension of Robinson-Chamberlin findings to the province of foreign trade.

The first two chapters of the book constitute the expository part of the study containing a rigorous definition of the various concepts pertaining to the subject and an appraisal of the previous work on trade monopolies and oligopolies. In the next two chapters the analytical framework of the study is fully constructed. Various models of foreign trade are built up under differing conditions of market control and a detailed analysis of the problem of trade under each model is undertaken. Special geometrical constructions are invented as an expository device.

Chapter v is an extension of the Pigovian Welfare concept into the realm of world trade. The relative gains from trade in different models are examined with the aid of Marshallian curves. The author demonstrates that world interests at large can best be served, subject to certain reservations, if the internal and foreign traders pursue an expansionist policy. The closing chapter seeks to make a transition to a trading world of uncertainty from the static world of the foregoing analysis. It indicates the difficulties to be met

with in applying the analysis set out in this study to the dynamic problems of the real world.

This book was originally written as a thesis for the Ph.D. degree of this University under the guidance of my colleague Professor J. J. Anjaria. Professor Anjaria's services have been lent to the International Monetary Fund and Dr Rangnekar is at Cambridge engaged in further research. In spite of their absence the book has been seen through the press by the willing co-operation of Mr B. V. Krishnamurthy, M.A. Research Assistant in Economics in the School. Because of his special knowledge of the subject and familiarity with mathematical technique, he was able to render valuable assistance in reading the proofs and in preparing the index.

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17 November 1947

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LIST OF ABBREVIATIONS

A.E.R.	The American Economic Review
Econ.	Economica
Econ. N. S.	Economica (New Series)
Economet.	Econometrica
E.J.	The Economic Journal
L.S.E.	London School of Economics
J.P.E.	Journal of Political Economy
Q.J.E.	The Quarterly Journal of Economics
R.E.S.	The Review of Economic Studies
(*A*) *R.E. St.*	The Review of Economic Statistics

INTRODUCTION

i

IN the causal analysis of economic development it is usual to stress the extension of markets and increasing returns as links bound together in a continuous chain. The growth of roundabout processes bring potential uses of factors within the ambit of actual business practice. Such growth, it is pointed out, must wait upon the extending size of the market. For the latter intensifies the division of labour and specialization of occupations. In the place of a single many-product industry there arises a honeycomb of one-product industries catering for a bigger and varied demand. Thus the widening of the market and growing complexity of the division of labour together work out a progressive change in the economic system which 'propagates in a cumulative way'.[1]

Along with industrial disintegration, however, there is also at work a reverse process of concentration underlying modern economic development. In many industries newer technological methods making for greater roundaboutness of production cannot be employed unless high overhead costs are incurred and large and steady volume of demand assured. Only large firms can employ such methods. But these can maintain and extend their hold on the market by beating down rival firms and effectively restricting the entry of new ones by a policy of price reduction and effective marketing and sales promotion. By such means large firms tend to become larger and succeed in driving their weaker rivals off their market or more often forcing them into mergers. There ensues a decline in the number of competitors which may result in complete monopoly established by one

[1] A full exposition of this process is to be found in Allyn Young, 'Increasing Returns and Economic Progress' *E. J.* Vol. XXXVIII (1928).

concern or in oligopoly set up among a few concerns. The large concerns are able, by means of economies of vertical and horizontal integration, to cut down prices and costs and thus to restrict effectively potential competition from newcomers.[1]

Although the above trend need not be interpreted to imply the inevitability of monopoly[2] nor any 'logic' of industrial organization, it seeks to stress the growing importance of monopolistic or quasi-monopolistic forces. In the United Kingdom as many as thirty sub-committees appointed by Parliament 'confirmed the belief that a strong movement towards centralized control was in a process of generation at the time of these investigations in the years 1919, 1920 and 1921'.[3] The Board of Trade Committee of 1931 also called attention to the 'tendency for combines or combinations to increase in number and importance'.[4] Austin Robinson maintains that recent industrial trends in England have brought 'almost the majority of industries into a condition in which they are dominated by a few large firms'.[5] Thus the dominant factor is not monopoly, but quasi-monopoly (oligopoly) with price-leadership. This is also confirmed by a recent study, *Industry After the War* which observes, 'in practice, over a wide range of industry the level of output is decided by a few dominant firms or by some forms of Trade Association. Competition continues but in a limited, "imperfect" form'.[6] A

[1] For detailed account of the means commonly employed to establish monopolies see Austin Robinson, *Monopoly*, ch. iv.

[2] A refutation of this view will be found in Lionel Robbins: 'The Inevitability of Monopoly' in *Economic Basis of Conflict and other Essays*. Also, Austin Robinson, 'The Problem of Size and Management of Firms', *E. J.* Vol XLIV (1934). In his *Monopoly* he observes, however, that in economics as also politics 'the tide today is set towards monocracy. It must not be thought that time and opportunity can be trusted to re-establish competition'. p. 37.

[3] A. F. Lucas, *Industrial Reconstruction and the Control of Competition*, p. 18.

[4] Board of Trade, *The Restraint of Trade*, p. 7.

[5] A. R. Burns, *The Decline of Competition*, p. 2.

[6] Charles Madge, *Industry After the War*, p. 12.

recent study of American industry points out 'at least as early as the eighties competition gave place to pools and agreements in the meat, steel, salt, whisky, coal, cordage, explosives and other industries. Single corporations secured control of a very large part of all the business in the sugar, starch, oil, tobacco and many branches of the steel fabricating industries'.[1] Robinson tells us 'monopolies in the United States of America have assumed a more virulent aspect and have provided more difficult problems of control than in almost any other country'.[2] Similar evidence can be adduced in respect of pre-Nazi Germany, France and other countries whose economic life was not subjected to central control.

It is essential to distinguish clearly between two forms of industrial concentration—monopoly proper and quasi-monopoly or oligopoly. In the former, the rival firms are merged into a single concern, so that there are no rivals, at least effective rivals, to the concern left in the field. Trusts, cartels and mergers are typical organizations of such type. In the latter, the firms, though few in number, are all competing with each other, and the pattern of competition is set by patents, salesmanship devices and price-fixing and price-maintaining machinery. The difference between the two forms does not rest mainly on the size of the concern, as on its control on the product market or its monopoly power exercised through price-output leadership. It follows that the greater the power, the more unrivalled will be its leadership. Now such leadership is attained usually by heavier capital investments, greater economies of integration and larger selling and marketing outlays. It is accompanied by a historical (secular) reduction in transport costs cumulatively leading to a wider geographical distribution of demand, improvement of productive technique, expansion in the size of industrial concerns and

[1] *Monopoly*, p. 268.

[2] op. cit., p. 196.

a consequential increase in the scope of monopolistic leadership.[1] But the growth of such leadership brings in its wake resolute efforts of new competitors to vanquish it and force their entry into the privileged field. Thus over a large area of modern industrial enterprise, there may be observed 'this trimorphic series, competition, combination, monopoly and then again further competition, thus follow[ing] each other in kaleidoscopic permutation, reminiscent in many ways of their political counterparts, democracy, oligarchy and tyranny. In both spheres the tide today is set towards monocracy'.[2]

ii

The monopoly complex is not confined to the area of domestic trade, but has already invaded the province of international trade. There exists enough evidence to show that freedom of trade is held in abeyance by monopolies and oligopolies in export industries.[3] Since the contours of world trade have shifted away from the free trade pattern, it is necessary to find out how far and in what respects the traditional theory on the subject needs revision.

This study attempts the above task. Its purpose is to restate the pure theory of international trade so as to bring it into line with the recent work on monopoly and imperfect competition. Thus its main purpose is to extend to the sphere of the former the conclusions which have been reached in the latter.

[1] Levy maintains that industrial combination must not be regarded as an unnatural, artificial form of organization bolstered by State support or other agencies, but 'it is as organic as the system of free competition'. (*Aspects of Industrial Combination*, p. 22). This is however true mainly in regard to combinations in manufacturing industries. Combinations and control of primary product industries have depended upon and often been brought about by State aid and initiative (see J. W. F. Rowe *Markets and Men*, pp. 14-16).

[2] *Monopoly*, p, 37. There is, however, no determinate relation between economic developments and growth in the size of industrial undertakings. See 'Temporary National Economic Committee, U.S.A.' *Final Report and Recommendations*, p. 89.

[3] See *post* ch. i, sect. vii.

The theory of imperfect competition heralded by Dr Piero Sraffa in his well-known article, 'Laws of Returns under Competitive Conditions', *Economic Journal*, December 1926, and systematically expounded by Mrs Joan Robinson in her *Economics of Imperfect Competition* (1933) and Professor Edward Chamberlin in his *Theory of Monopolistic Competition* (1933) has by now passed into general acceptance. Since the publication of these two treatises there has been a continuous stream of papers and monographs exploring various aspects of value and distribution under all types of market imperfection. Professor Chamberlin lists 481 items in his bibliographies published in 1938 and 1941.

Yet the work of this newly explored territory has remained confined within the bounds of domestic trade, save for a few articles from Miss Lovasy, Marsh, McDiarmid, McIntyre and a few others. The standard works on international trade theory such as Taussig's *International Trade*, Viner's *Studies*, Haberler's *Theory*, Ohlin's *Inter-regional and International Trade* have expressly confined the scope of their treatment to conditions ruling under perfect competition. Only the last two works have made passing references to the problems of imperfect competition. In this respect Haberler observes in the preface to the second edition of his book (1935): 'It seems to me that the theory of international trade, as outlined in the following pages, requires further development, in two main directions. The theory of imperfect competition and the theory of short-run oscillation (business cycle theory) must be applied to the problems of international trade.'

Two reasons may be adduced for the want of extension of Robinson-Chamberlin findings to the province of foreign trade. In the first place it is argued that between domestic and foreign trade there exists no distinction of analytical significance. Factor immobility is characteristic to both kinds of trading

though it may be more pronounced in the latter. This is no doubt true. Yet the real distinction between these two spheres will be found in that, while in domestic trade we are interested in individual buyers and sellers reacting to various market ratios, our point of view shifts in foreign trade to these buyers and sellers *aggregated* into an economic nationality and linked up with those of another nationality by means of a rate of exchange whose variations directly affect both of them in their entirety. This difference calls for a special effort to apply imperfect competition theory to international trade. It requires further to be recognized that between one country and another there exist, indubitably, differences in currencies (money rates of exchange) and commercial policies. These need to be brought within the ambit of a reformulated trade theory postulated upon market imperfection.

Secondly, it is sometimes held that international markets approximate much closer to the norm of competitive perfection than do the internal markets. The view is supported by the fact that staple products of international trade are highly standardized, and that there are price uniformities between them. This is, however, not enough to secure market perfection and to eliminate market control. Trading monopolies and cartels may exist, and as facts reveal do exist, in spite of price and product standardization Moreover, the recent trends in world trade show that an increasing range of traded products are differentiated, thus giving scope for price and sales competition which is truly 'imperfect', that is, oligopolic in nature. The growth of trading monopolies and oligopolies has diminished the area within which perfect competition can operate in world trade.

It follows that the analytical framework of foregin trade doctrine needs to be reorientated so as to accommodate various kinds of market imperfection. In this task difficulties are encountered at the

outset because, even after continuous research in the field over a decade and half, there is as yet no agreement on basic concepts, their meaning as well as classifications. In the opening chapter, Types of Market Control in International Trade, an attempt is made to formulate with rigour the meaning of 'perfect competition', 'monopoly', 'imperfect competition' and to indicate the bearing of the 'supply curve' and price reaction coefficients on 'industry' as also the 'commodity-types'. In the course of the discussion the implications of freedom and restriction of entry are examined and, while assessing the meaning and scope of these concepts, it is investigated how far they are relevant to the international markets. The chapter also contains an appraisal of the previous work on trade monopolies and oligopolies.

The preliminary ground thus covered, the second chapter investigates The Technique of Equilibrium and Gains-from-trade Analysis. Here is undertaken a general survey of the specific problems of trading equilibrium and welfare, with a view to indicating the method to be followed in the subsequent analysis of trading under various types of market control. Haberler's and Lerner's reinterpretation of comparative costs as displaced (value) alternatives is accepted and it is shown how the indifference curve apparatus can wield any market situation. Further the Marshallian Willingness-to-Trade Curves are shown to be of great service in all types of welfare comparisons. These are thoroughly consistent with the conception of costs and displaced alternatives. These two chapters constitute the expository part of the study.

Various models of foreign trade markets ranging from simple to complex are built up in chapter III, Monopolistic Trade and chapter IV, Duopolic and oligopolic Trade: The regime of Imperfect Competition under various conditions of market control. Each of the models is serially analysed and conclusions about terms of trade, volume of trade, rates of employment

and volume of employment are set forth in a formal way. In these two chapters the analytical frame work is fully constructed and the results of analysis set out. Chapter v, Welfare Commentary on the Foregoing Types of Trading, proceeds to exhibit the relative gains-from-trade in the different models. The welfare comparisons are set out by means of the Marshallian Curves.

The closing chapter seeks to make a Transition to a Trading world of Uncertainty from the static trading world with which all the preceding chapters were concerned. Uncertainty is classified according as it arises from (i) capital movements, (ii) monetary (exchange) fluctuations and (iii) divergent commercial policies. This chapter is discursive in its treatment and does not purport to be analytical in handling the various dynamic problems classified in the course of the discussion. Its purpose is to indicate the nature of problems to be met with in this sphere and to discuss the bearing on our analysis in this study of the dynamic problems of the real world.

CHAPTER I

TYPES OF MARKET CONTROL IN INTERNATIONAL TRADE

IN its traditional formulation the theory of international trade maintains that the resources of different countries would be put to the greatest advantage if their markets were open to unrestricted freedom of trade. Ricardo's proposition in this respect is well-known—'under a system of free commerce each country naturally devotes its capital and labour to such employments as are best beneficial to each.'[1] Free trade is here regarded as natural in the same sense in which free barter or exchange is natural: it is rooted in the tendency in human nature to seek from one's fellow men what one does not possess and thus to engage in co-operative want-satisfying activity.[2] The unequal distribution of resources, human and physical, over the surface of the earth should induce men, of their own accord, to enter into free exchange for mutual benefit. Or to put the matter in the terminology of the Austrians, free commerce is a means which consumers as between one country and another have to adopt (and should adopt consistently with rationality) in order to equate their preference ratios with scarcity ratios.[3]

The postulate of freedom of commerce which is by itself simple and unambiguous is associated with another postulate of perfection of competition. These two, on a superficial view, seem to have identical meaning which, however, is not true. The former refers mainly to the absence of restraint or restriction

[1] *Principles*, (Gonner's ed.), p. 114.

[2] For a critical analysis of the philosophical foundations of 'natural law' in economics, see Max Beer, *An Enquiry into Physiocracy*, ch. III, p. 52 ff.

[3] Ohlin's theory as to the origin of trade between regions and nations is an elaboration of this point. See *Inter-regional and International Trade*, pp. 10-13. There is in this theory no departure from the Austrian exposition as is sought to be made out by P. T. Ellsworth, 'A Comparison of International Trade Theories', *A.E.R.*, Vol. XXX (1940).

on voluntary purchase and sale of goods in the market, while the latter essentially refers to the complete absence of control either by buyers or sellers on the terms of exchange, in other words, on price-determination. The one thing depends on unhindered entrance or exit of exchangers; the other on their ability to control or influence the process of exchange. It is necessary to bear in mind that although buyers and sellers are free to compete among themselves the exchange situation may nevertheless contain within itself certain elements of control exercised by one or the other party whereby the market though free would cease to be perfect. Our immediate task is, therefore, to find out what such elements of control are, and further, what should constitute the criteria of market perfection. Once these criteria are defined we can then proceed to examine the framework of monopoly and imperfect competition in domestic and foreign trade.

i

The conceptions of perfect competition and monopoly have been carefully analysed and refined from the days of Cournot. Developments from his time down to our own can be mapped out along two routes by which the problem has been approached. One of these is followed by economists such as Cournot and Edgeworth who sought to base the concept of perfect competition on its mathematical properties. The former considers competition to be unlimited when the output of the individual seller is inappreciable with respect to the total supply in the market and also with respect to the marginal supply price.[1] The latter required a perfectly competitive field to possess 'multiplicity and dividedness', that is to say, a very large number of bargainers and continuous divisibility of the bargains.[2]

[1] *Mathematical Researches into the Theory of Wealth* (Bacon's Translation), p 90.

[2] *Mathematical Psychics*, p. 18. A perfectly competitive field is also normal which requires perfect intercommunication throughout the market. But this is a necessary but not sufficient condition for perfection as with the other group of economists.

Then there is an alternative route adopted by Jevons, Marshall, Pigou, Knight and others who proceed to the psychological foundation of the concept. For Jevons a perfect market and the competition in it simply means 'all traders have perfect knowledge of the condition of supply and demand and the consequent ratio of exchange'.[1] Marshall and Pigou[2] take the same view. Knight also lays down the same condition 'perfect, continuous intercommunication' which implies 'perfect knowledge of what they are doing on the part of all exchangers'.[3]

In the new work on imperfect competition which started with the path-breaking article of Piero Sraffa (*E.J.*Vol. XXXVI, 1926) there has been a searching inquiry into various types of markets and the nature of market competition, the meaning and significance of 'commodity' and 'industry' and allied concepts. As regards the market Cournot had already explained that it denoted 'the entire territory of which the parts are so united by unrestricted commerce that prices take the same level throughout, with ease and rapidity'.[4] Such a territory is in reality without any magnitude : it is 'a point without any length, breadth and thickness'.[5]

The commodities sold in a market can be classified into 'types' or 'classes'. These commodity types are manufactured by various rival firms. If their products are identical, the commodity-type is homogeneous and standardized. On the contrary if they are not identical but patterned into brands and trade-marks, the commodity type is differentiated and heterogeneous. In the former case a well defined industry results; in the latter the concept of industry becomes

[1] *Theory of Political Economy* (3rd ed.), p. 87

[2] *Principles* (8th. ed.), p. 540. *Economics of Stationary States*, p 76 *In Economics of Welfare* (3rd ed), p. 231, Pigou defines simple competition as that wherein 'each seller produces as much as he can at the ruling market price, and does not restrict his output in the hope of causing the price to rise'

[3] *Risk, Uncertainty and Profit* (*L. S. E.* Reprint), pp. 78 and 86.

[4] op. cit., p. 51. Jevons, op cit., 85n. Marshall, op cit., 324n.

[5] Harold Hotelling, 'Stability of Competition', *E.J.* Vol. XXXVIII (1928).

somewhat hazy and awkward, and requires further investigation (section v below).

It is emphasized that in a perfect market all buyers and sellers must deal in a homogeneous commodity-type. Without such homogeneity the market is segmented into varieties, each distinguished and patented by means of a trade-mark.[1] Secondly, competitive behaviour characteristic of a perfect market is free from preferences of particular buyers for particular sellers and, conversely, the bargainers are indifferent as to the parties with whom they enter into contract. It may be recalled that, in a similar context Mill discusses the frustrating effect of custom and convention on the free play of competition.[2] Knight also lays down rationality as an adjunct of perfect competition.[3] Thirdly, the absence of control on price either by buyers or sellers is discussed more fully in recent work and its implications set forth with greater clarity. What has been achieved in the last respect is an elucidation of Cournot and Edgeworth.

ii

As seen above, Cournot regarded competition to be unlimited provided that the output an individual contributes to the market is so small (that is to say, an infinitesimal quantity) that its withdrawal from the market does not affect the individual output contributed by each of his rivals and hence the market price. But this condition is not satisfied, nor can it be ever satisfied by any market in the real world. For in order that a unit change in the individual output should have no perceptible influence on the outputs of other firms and hence on the market price of the product, the number of rival firms will have to be indefinitely large. It is, therefore, necessary to temper the Cournotian rigour and to modify his

[1] Chamberlin, *Theory of Monopolistic Competition* (3rd ed.), p. 7.

[2] *Principles*, (Ashley Edition), Bk. II, ch. IV, sect. III.

[3] op. cit., p. 76.

condition as Mrs Robinson has done, so that 'competition is more perfect, the smaller is the ratio of the output of one firm to the output of the industry, and the greater is the elasticity of the total demand curve'.[1] According to this, competition may be said to be almost perfect, if a small change in a firm's output were to produce *negligible* effect on the price and output of other firms. What is essential is that the individual seller should sell his output at the market price which he *estimates* to be beyond his control. This is possible when the number of firms is sufficiently large, save under special conditions.[2] The number of firms is, however, a corollary from the above condition. On the other hand, high elasticity of total demand is an essential requisite because 'it represents the degree of competition between the product of [this] industry and other commodities'.[3]

Mrs Robinson accepts the above as a sufficient condition for market perfection.[4] Yet there are cogent reasons for considering this by itself as by no means a sufficient condition of market perfection. It is recognized that a perfect market should be one which calls forth the maximum supply from various competing firms without allowing them scope for restrictionist measures.[5] Now, under the usual conditions in which the competitive firms operate, maximum output can be secured only at minimum average costs.[6] If the firms are to produce this much output, that is to say they are to be optimum in size, the equilibrium price must be equal to minimum average costs. Such equilibrium can be reached pro-

[1] Joan Robinson, 'What is perfect Competition?' *Q. J. E.* Vol XLIX, 1935, p. 116.

[2] Even a few firms can act as perfect competitors, provided each one expects his own output to be very small and the market price to be given.

[3] Joan Robinson, op cit., p. 116.

[4] R. G. D Allen also regards this as a sufficient condition. See *Econ.* Vol. XII (1932), p. 213.

[5] This is a point which is explicitly brought out in Pigou's definition of Simple Competition quoted above.

[6] E. A. G. Robinson, *Structure of Competitive Industry*, ch. ii.

vided there exists full freedom for new firms to enter and old firms to leave. In other words, the resources already invested in the industry must not earn more than their opportunity costs because of the impossibility of inflow of new resources. This condition can be realized only when there are more sellers as it were continually hovering on the brink of every industry and always willing to enter as soon as the existing sellers start earning quasi-rents.[1]

This brings us to the conclusion that perfection of the market requires (i) perfect knowledge and intercommunication among the bargainers, and the absence of preferences by any one for any other bargainer; (ii) standardization and homogeneity of the product and hence the absence of varieties and trade marks; (iii) lack of control either by buyers or sellers on the ruling market prices; (iv) full freedom for more resources to flow into any industry and hence, the absence of quasi-rents or 'abnormal' profits, that is, earnings in excess of the opportunity costs.

iii

Let us now proceed to apply the above criteria to international markets.

The first two conditions are readily applicable and require no special comment. According to them the knowledge of commodities and prices must be quickly transmitted from country to country so that prices could be equalized for identical commodities.

Next consider the third and fourth conditions: these are concerned with the structure of competitive industry in its relation to the market. The home industries that feed a domestic market are composed of competitive firms obtaining their resources at home which are mobile to a great extent. As opposed

[1] See Fritz Machlup, 'Monopoly and Competition: a Classification' *A. E. R.* Vol. XXVII (1937); also, 'Competition, Pliopoly and Profit' *Econ. N. S.* Vol. IX (1942). A further discussion of this point is taken up in ch. iv, model B, sect. B.

to this there is little or no mobility of resources, especially of labour, as between the export industry of one country and another. This is due to 'the fancied or real insecurity of capital together with the natural disinclination which every man has to quit the country of his birth and connexions'.[1] No doubt capital movements between countries are becoming more free owing to the greater similarity of manners and institutions than formerly.[2] Even business power may flow freely from country to country but 'labour cannot be conceived to be moving freely'.[3] For these reasons the size of firms and the structure of industries that make export products is not directly influenced by competition from abroad. In other words there can be no scope for unrestricted inflow or outflow of resources from one country to another in response to changes in price and profit-expectations.

The third condition lays down that there must be no scope for any buyer or seller to control price. If this is to be satisfied by an international market it follows that the ratio of exports of a particular product from any country to the total volume of world exports in that product must be so small as to prevent the former by a slight change in its exports from influencing the net (selling) price in any (importing) country; and similarly so for an importing country. Now the question is, when are the traders of a country rendered powerless to influence price? This is only possible when there exists freedom of entry to more sellers who hover on the brink of the industry in the expectation of high profits. Thus we arrive at the fourth condition: in an export industry which is, by definition, closed to foreign industrialists, potential competition can be secured only by keeping the door open to home industrialists standing in readiness to invest their resources as soon as (opportunity) rents rise. There is, however, another possibility of

[1] Ricardo, *Principles*, p. 117.
[2] J. S. Mill, *Principles*, p. 575.
[3] Edgeworth *Papers* Vol. I, p. 5

potential competition. A country which has not hitherto specialized in a particular industry may divert its resources into this as soon as prices and comparative costs are favourable. Moreover another country which could not formerly develop its resources needed for the product may now do so because prices are adequately high and are expected to be high for a sufficiently long period. In these two ways potential competition can make itself felt in the international markets and bring them nearer perfection.

A corollary needs to be added to the above conditions in order to complete our analysis. Competitive perfection in international trade requires unhindered freedom of entry of goods into any country; in other words, the absence of tariffs, quotas, dumping and all types of restrictions which militate against free trade. Though an implication of the fourth condition it needs to be explicitly stressed because its relevance is evident in international but not in domestic trade in which at least all modern countries have swept away internal barriers against movements of goods and services.

iv

Against the background of perfect competition there emerges into view the whole terrain of monopoly and quasi-monopoly—what may be called non-perfect or controlled competition. We are now confronted with diverse theories and doctrines dating from Cournot, to which ever-growing contributions have been made since the publication of Sraffa's article. It is not our purpose to examine the various tenets of these doctrines. Such an examination has already been carried out by Triffin in his recent study.[1] We shall be mainly concerned with throwing into sharp relief the main issues with which a theory of monopolistic and quasi-monopolistic trade has to deal, and it is in this connexion that we shall try to

1 Robert Triffin, *Monopolistic Competition and General Equilibrium Theory* (1940).

appraise the relevance and adequacy of Robinson-Chamberlin findings to our problems. As before let us first set out the issues in the context of domestic trade and thereafter pass on to foreign trade.

In the Cournotian theory of monopoly[1] the producer-seller is assumed to be in sole possession of a commodity of uniform quality, e.g. the mineral spring water. The same idea is adopted by Marshall and Edgeworth.[2] Defined in the literal sense, the monopolist is thus taken to be a single seller in whom is vested complete control over sales. Now the concept of commodity causes some trouble in this way of interpretation. Can we be sure that between the product of one seller and of another there exists a uniform quality, that is, a homogeneous commodity-type ? Even if there is a slight difference between two products even so much as separation in space—the Cournotian definition rigidly interpreted would make each seller a monopolist in respect of his 'commodity'. Mrs Robinson observes, 'every individual producer has a monopoly of his own output. . . . We have only to take the word monopoly in its literal sense and the analysis of monopoly immediately swallows up the analysis of competition'.[3] But this would leave no room for a theory of competition between sellers who are producing a more or les. similar commodity. Hence she defines this latter as 'bounded by a gap in the chain of substitutes on all sides'. But how are we to determine where the chain ends, and further how can it be decided whether the maker of a substitute is not a monopolist ?

These difficulties can only be resolved if we penetrate beneath the apparent meaning of the term monopoly. In the first place, a single seller who

[1] Cournot, (Bacon's translation), op cit., p. 79 ff.

[2] *Principles*, p. 478, wherein Marshall takes a gas company as a typical monopoly concern He was, however, fully aware of the existence of partial monopolies depending upon goodwill and other factors ; see p. 60n. Also *Money, Credit and Commerce*, p. 206 ; *Papers*, Vol. I, p. 112.

[3] *Economics of Imperfect Competition*, p. 5.

controls the sales of a product can be called a monopolist only when he is undeterred by the presence of existing sellers and the prospect of new ones. In other words a monopoly implies closed entry.[1] Secondly, a monopolist who is in this unique position has to meet the total requirements of a market on the basis of a stable demand curve and also a stable cost curve both of which he knows full well, while under competititve conditions he should have to take into account a shifting demand price and a hypothetical supply curve deduced from the cost curves of other firms and their total output both of which he does not fully know but has at best to conjecture.[2] This second feature implies a stability of the monopolist's cost function : his production plan is longer in duration since the parameters involved in a competitive plan—the cost functions of other firms—are now eliminated and thus enable decisions to be less liable to risk and uncertainty. Thirdly, the monopolist by his unique position hires most of the requisite factors at rates which suit him best, instead of those which are settled by competitive bargaining between rival firms. It is this which enables him to resort to exploitation. The second and third features taken together explain why monopoly concerns are always in a position to undertake large scale investment policies and maintain excess capacity for industrial fluctuations. These features also throw some light on why firms operating under competitive conditions are liable to combine into a monopoly or to be forced into one when faced with the difficulties of adapting themselves to short-period changes.[3] The smooth, costless transition by every firm from one level of output to another

[1] Such a unique position is enjoyed usually by institutional monopolies From the point of view of absolute closure of entry most of the long term monopolies are institutional wherein entry is closed by law. Short time absolute monopolies are, on the other hand, conditional upon the development of effective substitutes, i e. the growth of technical knowledge

[2] Triffin has argued this point more fully, op cit , pp. 130 ff . and 146 ff

[3] See Pigou, 'Stabilization in Particular Industries' in *Economic Essays and Addresses*, p. 38.

as postulated by the long-run Marshallian supply curve is admittedly a theoretical simplification which conceals the problem of adaptation of firms to changes during the process of transition. It is such difficulties of adaptations which are a frequent cause of tacit agreements and combinations especially in times of industrial crises.[1]

From the foregoing argument, it should be clear that the monopolist is a unique and strongly entrenched seller because he can operate behind closed entry and so build up a stable cost structure which enables him to produce his 'commodity' within a *price-range* beyond the scope of producer's substitutes. This price-range is the inelastic part of the monopolist's demand curve and it is only the relevant part with which the monopolist is concerned. So long as he sells the product within the range he has no reason to fear the competition of his substitutes, and his price policy is not influenced by the reactions of the competitors. Once we take this position, there need be no difficulty in defining a commodity or commodity type It is to be regarded as a fabricated product which producers offer to a class of consumers within a range of prices estimated by them to yield graduated revenue. If within this range the producer is in sole control of supply he can frame his policies regardless of rivals' reactions, he is a monopolist.[2] On the contrary, if he possesses no such unique control on supply and has to take into account the reactions of rival producers provoked by his price-policy, he is a competitor. Monopoly 'complex' in Hermann Levy's sense would have a greater scope where entire supply could be brought under a seller's control and the manufacture

[1] Most of the international cartels have come into existence as a result of industrial fluctuations.

[2] It is in this way that we have to interpret Robbins' definition of monopoly : 'There exists a monopoly where the sale of any type of commodity is in the hands of a single controlling authority ' See 'Inevitability of Monopoly' in *Economic Basis of Class Conflict and other Essays*, p. 46. The single control is effective only within a certain price-range beyond which it is exposed to commodity substitution.

of substitutes would be rendered more difficult by technological causes hampering the entry of rival sellers.

For the conditions of monopoly equilibrium we have again to go back to Cournot.[1] The primary condition is the equality of marginal cost and marginal revenue. From this it can be deduced that the monopoly revenue would be equal to the excess of price over average cost multiplied by the equilibrium output. To this Mrs Robinson has added two theorems : That the price of monopoly output will be equal to marginal cost multiplied by $\eta/\eta-1$ where η is the measure of elasticity of demand ; and that for the monopoly equilibrium marginal revenue must be falling faster than marginal cost.[2] The elasticity concept first formulated by Whewell[3] and later on perfected by Marshall has enabled Mrs Robinson to enunciate the monopoly price theorem with much elegance.

V

Now we pass on to survey the territory of competition which may be called either 'imperfect' or 'monopolistic'—terms which are indeed very nearly the same. In our exploration caution has to be exercised while applying old concepts to describe the contours of a variegated landscape. Even here Cournot does not fail us, he was the pioneer. His was the first attempt at a rigorous formulation of the theory of duopolic competition. Yet he was concerned with homogeneous goods and thus his is a theory of pure duopoly. Hence his guidance does not take us far. We are now interested in exploring problems which are connected with the pricing of differentiated products—those which are usually called substitutes. Thus our concern is with impure duopoly and oligopoly.

The first difficulty we meet in our way concerns the meaning of the commodity-type in relation to

[1] op. cit , p. 52.

[2] op. cit , p. 36.

[3] D. H McGregor, 'Marshall and his book' *Econ. N S* Vol. VIII (1942).

competing substitutes. The question is again raised: How far can the chain of substitutes be extended within the limits of a 'type'? As we explained in the last section a competitor has to reckon with the reactions likely to be provoked in the rival firms by the price-policy he contemplates. This is true about all types of competition. But in the limiting case of perfect competition the reactions are taken to be infinitely large, since a slight change in the price would mean either a complete control or complete loss of the market according as the price was diminished or raised. When the group of competitors is small the reactions are taken by each one of them to be finite. This is the real nature of oligopoly in the sense in which Chamberlin defines it. The oligopolists are operating within a price-field and their price-output behaviour is mutually conditioned, i.e. it is defined by the cross-price coefficients.[1] The products are sold within this price-field to a class of consumers whom the sellers regard to be partially attached to their own products but who can all the same be weaned away to a partial extent by means of salesmanship. A commodity-type is composed of all such products in respect of which there is price, quality and sales-competition.

The next difficulty is about the concept of 'industry' and its analytical associate, the supply curve. The former runs all through classical economics which sought to disentangle the market influences exercised by large-scale highly integrated economic units as distinct from the small-scale unintegrated units in agriculture. The Marshallian construction of the supply curve was devised to encompass the analysis of particular employment of all types, manufacture or agriculture, wherein several competing units, that is firms or concerns, produce 'commodities'. It is well known, however, that Marshall connects the supply

[1] This was first pointed out by Frisch in connexion with duopolic competition (see ch. iv, mod. A below) and later on by Kaldor, 'Market Imperfection and Excess Capacity' *Econ. N. S.* Vol. II (1935). Triffin makes it the basis of his *Monopolistic Competition Theory;* op cit, ch. iii, p. 100 ff.

curve with the representative firm ; yet the construction can be kept intact provided his assumption about such a firm is abandoned and in its place is set up the more acceptable one of the optimum firm. The supply curve implies a functional relation between the individual outputs of firms and the ruling market price at which they sell their output. Without a uniform market price there can be no supply function for the *whole* industry. So long as competition is perfect, the firms are all optimum in size, and their aggregate will constitute an industry with its demand and supply schedules. The trouble arises when competition becomes imperfect. The firms are now less than optimum in size and they do not react to the price stimuli which can be denoted by an explicit supply function. It is this indeterminateness which strikes against the supply curve and the concept of industry.

There is however a way out of this complication; we may regard competing firms to be large enough to regard their own prices to be uniquely related to a given average or model price.[1] The supply function of the industry 'the large group' is now determinate and can be found out from $\eta_k = \phi\ (p_k/p)$ where η_k is the elasticity of demand of a certain firm, K, p_k its own price and p the average price derived from p_a, p_b, $\ldots p_k$, $\ldots p_n$. Since we are now taking the group to be large, there would be a consequential equality of price with average cost resulting from competition between old firms and the new entrants who have been lured into the group by supernormal profit-expectations. There is now purity of competition but no perfection, since price is higher than marginal cost. What Mrs Robinson calls the Kahn Theorem ($AR = AC$ but $AR > MC$) has come into operation ; as shown by Chamberlin, the group equilibrium now remains stable and determinate. Under this type of market imperfection the concepts of industry and the supply curve retain their meaning and usefulness.

[1] See M. Kalecki, 'The Supply Curve under Imperfect Competition' *Econ. N. S.* Vol VII (1939-40).

Even if the group of firms was small, it might be legitimate to assume that the few firms behave *as if* their price output policies were determined not by each other but by a certain model price p as above. Or else it may be assumed that once their price-policies arrived at a position of stable equilibrium they would, by *tacit agreement* cease price-or-sales warfare. Further, it is also possible to postulate that one firm acts as a price leader and the others are its followers. In each of the above instances there would be no instability of equilibrium. Yet all these are special assumptions by which a situation which is essentially unstable may analytically be made stable. As a matter of fact when the group of sellers is small, there will be for the groups an indeterminate tract through which the index of value will oscillate, or rather will vibrate irregularly for an indefinite length of time',[1] as in the Edgeworth problem of duopoly. Under such conditions the concept of the supply curve breaks down. So long as the products made by the firms are interdependent with cross-price coefficients less than infinity and greater than zero, the group of firms still constitutes an industry, though the boundary lines marking off the entire group from other groups may keep on shifting because of the indeterminateness of group equilibrium.

Let us now turn to selling costs. As shown by Chamberlin they are bound up with imperfect competition analysis, and this is indeed his striking contribution to the general theory of the subject. All types of selling outlays are usually incurred by the sellers in order to circumvent the rigidity of conventionalized prices and to win over clientele of rival sellers. There is no simple functional relation between selling costs and output. Hence 'the "competitive" cost curve which includes selling cost is inconsistent with itself, it is useless, it is misleading and it is of very

[1] *Papers*, Vol. I, p. 118.

limited meaning'.[1] The selling cost function involves two variables such that price is dependent upon output produced and the selling costs incurred on the output. As in the former regime where there were no selling costs, a firm's selling price is influenced by the reaction estimates of rivals. But the fact that these rival estimates do not necessarily tend to a stable equilibrium has shown how the selling cost makes the equilibrium unstable. We must, however, realize that indeterminateness is characteristic of selling cost equilibrium due to the divergence of reaction estimates, though here again the situation can be made determinate by restrictive assumptions.[2]

vi

It remains to consider how far the characteristics of monopoly and oligopoly discussed in sections iv and v are applicable to the sphere of international trade.

In a domestic monopoly the seller is in control only of the home market. While in international trade monopoly, his control extends to home and foreign markets. In order to drive out existing or potential foreign competitors, he may discriminate between the home and foreign consumers, the latter being charged lower-than-cost prices at the expense of the former. This is the familiar method of dumping. In our analysis of monopolies in international trade we shall rule out the home market and consider only the foreign markets where the monopolist finds scope for price and output control. By this way we shall be able to bring into clear relief monopolistic problems specific to foreign trade. The same restriction in the scope of treatment will hold for problems of oligopolistic trade.

[1] *Theory of Monopolistic Competition*, p. 213.

[2] It is however shown in ch v, sect. ii that selling cost equilibrium is indeterminate in respect of output but not necessarily in respect of selling prices. The special assumptions necessary for determinacy are discussed in the same section.

There are two ways in which trade monopolies and oligopolies can exist. In the first place one industry may produce and export its wares under conditions of non-perfect competition, yet all the other industries in the country operate under conditions of perfect competition. This case requires that the particular monopolized or oligopolized product is under the control of an individual seller but he is surrounded on all sides by perfectly competitive sellers. Secondly, all the industries which export their wares from a country may wholly operate under conditions of non-perfect competition. Here all the sellers come to have control over their individual export markets. Yet if they want to make this market control effective, it is necessary that their selling policies should be integrated by a central Trading Syndicate or Cartel. In this case the country would resort to state-trading.

The first case of trade monopoly or oligopoly is common whereas the second is exceptional in the real world; since it implies a complete abandonment of free enterprise in the realm of foreign trade. In our subsequent analysis we shall be mainly concerned with the former type.

Whatever be the type of monopoly and oligopoly in foreign trade, we can readily apply to it the features of monopoly already discussed in section iv : (a) total control over the sales of 'product' unhampered by the reaction of rival sellers ; closure of entry into the industry, (b) stable cost structure, that is, production plan, and (c) control over the rates and volume of employment of most of the hired factors. In the same manner we can also extend the features of oligopoly : (a) partial control over the sales of the product conditioned by the reactions of rival sellers ; (b) stable cost structure, that is, production plan ; and (c) control over the factor market, both subject to interdependence as between various sellers.

There are, however, two types of oligopolic interdependence to be considered. It is possible that there

may be, let us say, three oligopolists, p, q, r, within a particular country which is trading with other countries B and C. On the other hand, it may be that these three oligopolists come not from the same country, but belong each to a different country. So that p exports from A, q from B etc. Analytically the former case is in fact one of monopolistic trade since the group of p, q, r, taken together would give us a monopoly, though with an unstable group equilibrium. On the other hand, the second case is one wherein the traders from countries A, B, C, are oligopolists whose policies affect the trading relationships of the entire countries. This is a specific instance of oligopolic trade. In our treatment of the problem the second type of trading alone will be considered.

vii

A question emerges from the formal analysis of the preceding sections: how far does it conform to the realities of the modern commercial world? To what extent do international markets fulfil the tests of perfection laid down above? Such an enquiry has to rely upon commercial data and available critical commentaries upon them.[1]

First, we must find out how far there is diffusion of knowledge and intercommunication as between trade markets, which is the primary requisite of a perfect market. On this the evidence is overwhelming. 'Outstanding among the factors which make for price uniformity are the complementary services—the cable, the telegraph and the wireless and the numerous services which swiftly and widely disseminate information regarding supplies, prices and the state of markets. In such a situation the flow of cabled bids and offers

[1] For inductive studies of recent trends in world trade useful sources are *P.E.P., Report on the International Trade*; League of Nations, *The Network of World Trade between Free and Controlled Markets;* Isaac Lippincott, *The Development of World Trade;* J. B. Condcliffe, *The Reconstruction of World Trade.*

alone tend to restrict price differentials to the cost of carriage and handling.'[1] This view of Zappoleon is based on a statistical investigation concerning prices of internationally traded commodities. Pratt also maintains that owing to cheap communications 'such a thing as a local price for a staple commodity (of trade) has ceased to exist'.[2] Similar conclusions have also been reached by other investigators.[3]

The next issue to be considered is the extent of standardization and homogeneity of internationally traded products. In this respect a distinction needs to be made between trade in foodstuffs and industrial raw materials and that in finished products. The former constitute the staples of world trade and they are sold by private auctions or through organized commodity exchanges. Commodities marketed on the exchanges can be accurately described by grade and number and can be technically classified; yet this is not always so about auctioned commodities which are more frequently heterogeneous in quality and grade, thus requiring personal inspection on the part of the buyer.[4] The common feature of all trade in staples is that 'it is next to impossible to establish goodwill for the individual producer or even for the product itself'.[5] On the other hand manufactured goods are not usually capable of standard classification, unless they are capital goods, and hence goodwill and preferences play an important part in their sale. Hence it

[1] L B Zappoleon, 'International and Domestic Commodities and the Theory of Prices, *Q. J. E* Vol. XLV (1931), p 43, also R F Harrod, *International Economics*, p 65

[2] Pratt, *International Trade in Staple Commodities*, p 8

[3] Bertrand Fox, 'International Price Relationship for Selected Raw Materials', *Explorations in Economics*, p 133 ff. 'In the case of five of the commodities (out of a selection of nine) the degree of coincidence (between prices in various trade markets) was very high, and each satisfied the two tests of an international commodity'. These two tests were (a) 'prices of internationally traded goods tend to be the same in all the markets of the world : (b) any circumstances disrupting equality of prices initiates pressure to alter prices and to restore equality.' The commodities that satisfied the requirements were tin, cotton, rubber, silk and coffee. 'The cases of other four commodities were not so decisive.'

[4] J. A. De Hass, *The Practice of Foreign Trade*, p 43.

[5] ibid, p. 33.

may be concluded that staple products are to a large extent standardized and homogeneous while manufactured are largely differentiated and heterogeneous.

Then we proceed to appraise how far prices of internationally traded goods lie beyond the control of importers and exporters. It was seen above that the rapid dissemination of market information brought about price uniformities in respect of staple commodities. Nevertheless the uniformities cannot, by themselves, warrant the absence of influence exerted on prices. In the first place, the demand and supply of staple products is concentrated within certain groups of countries.[1] Many of these products are sold by auction to large buyers from countries such as U.K. and U.S.A., and are apt to get better terms. In this the importers and exporters are greatly assisted by the information gained and facilities acquired through Trade Associations and Government Departments of Trade.[2] It is manifest that the era of small merchant houses has declined and we have already entered upon a new phase wherein primary trade markets are more or less subject to the influence of the Trade Association and the State Department of Trade. Secondly, the production and export of several raw materials have in recent years been subjected to artificial control schemes, and their prices, though uniform in all trade markets, have been held up at particular levels by internal and international agreements. All the same, there are still many staple commodities, especially foodstuffs not so far affected by such schemes.[3] The world trade in these is highly organized

[1] League of Nations, *The Network of World Trade*, p. 31. 'In the case of twelve of the thiry-two products considered in this table (No. 12) the largest importing group absorbed over half of the world imports, and in the case of ten products the largest exporting group supplied over half of world exports.'

[2] H. P. Killough, *International Trade*, pp. 294-9 and *P.E.P. Report* ch. vi for English and American trade practice.

[3] The main obstacle in the artificial control of foodstuffs is that the producing areas are too widespread and the number of producers in them too numerous to be brought under the scope of a single international scheme. Moreover a large proportion of agricultural output is consumed by the producers and also held over for lean years.

and the scope of price and output control is greatly minimized by the activity of exchanges and the arbitrage operations of brokers.[1] On a balance of these two forces, one making for market control, the other for its freedom and perfection recent trend in staple world trade appears to be decisively set in the direction of control.

Lastly it remains to examine to what extent there is freedom of entrance into (a) export industries and (b) trade markets. The former are either extractive or else manufacturing industries and the extractive industries supply goods nearly two-thirds in value of the total world trade in merchandise.[2] Now there is great diversity in the degree of freedom of entry into them. At the one end of the scale is the small scale wheat and cotton grower who cannot prevent any one coming into his line and has always to reckon with potential competition. At the other end there are large tea or coffee plantations and heavy oil and metal industries which are in a position to restrict or store output, and to discourage or prevent newcomers from entering their trades. While agriculture offers full freedom of entry, this is much more difficult in extractive industries. Apart from big investment cost which entrants have to incur they have to reckon with leases and monopoly privileges frequently granted to established concerns. These are usually organized into trade syndicates under state patronage. In particular extractive industries supplying fuel, raw-material and semi-manufactured goods such as iron and steel, have yielded without much difficulty to monopolistic control. In their survey of international monopolies of raw materials, Wallace and Edminister[3] (1930) have listed twenty commodities, two of which are agricultural, (coffee and cotton), and the rest extractive in

[1] De Hass, op. cit., p. 173.

[2] League of Nations, *The Network of World Trade*. Table No. 6 sets forth 61.9, 62.8 and 63.8 as the percentages of value of foodstuffs, raw materials and semi-processed goods in 1928, 1935 and 1937 respectively.

[3] *International Control of Raw-materials* (1930), p. 13.

nature. Staley[1] (1937) lists thirty-nine commodities, five of which are food-stuffs and the rest industrial materials. No information is available about the quanta and values of trade in these controlled commodities. It is however certain that they represent only a small share in the total world trade.[2] But it must be noted that since their demand is derived from the finished articles produced for the home and foreign markets, their monopolization on an international scale is reflected in the prices of such manufactured articles.

As to conditions regarding entrance into trade markets of the world there are already at our disposal numerous studies in inter-war commercial policy showing how the freedom of entrance has gradually been eclipsed by powerful forces mainly guided by autarky. Tariffs, subsidies, embargoes, quota agreements, bilateral treaties and various forms of exchange control have cumulatively piled up higher and higher the barriers against free trade. From recent surveys[3] it is evident that while most of the countries are anxious to obtain a steady supply of industrial raw materials from foreign sources, they have been reluctant to give other countries free access to their own supplies for fear that home industries may suffer, the supplies may be depleted and economic and consequent military security may be endangered. Thus raw materials are admitted freely but are exported under various restraints.

As a consequence of the growth of quantitative restrictions and exchange control the traditional system of multilateral trading has deteriorated and trade

1 *Raw Materials in Peace and War* (1937), Appendix C.

2 This follows from the fact that raw materials and food stuffs form a smaller part of the total trade of the world. See Lippincott, op. cit , p. 277. *Network of World Trade*, Table No. 6, p. 22.

3 A special study of import and quotas is made by H. Henser, *The Control of International Trade*, and a recent survey of inter-war commercial policy is to be found in Margaret Gordon's *Barriers to World Trade*.

connexions have become increasingly bilateral subject to periodical revision.[1] Countries which depend primarily on multilateral clearing have been hard hit by these developments, since these have entailed 'reduced commercial access to raw materials'. The net effect of all these restrictionist measures has been to reduce the area of world trade and to foster the control of the home market by the domestic producers. Thus there emerges before us a picture of the inter-war world of commerce in which international markets in primary products as also finished commodities were drifting away from competitive freedom, and restrictionist tendencies showed little signs of being brought under check.

[1] *The Network of World Trade*, pp. 89 ff., 95. For a fuller treatment of the above issues Haberler's and Viner's recent studies on *Quantitative Trade Control* and *Trade Relations between Free Market and Controlled Economies* may be consulted.

CHAPTER II

THE TECHNIQUE OF EQUILIBRIUM AND GAINS-FROM-TRADE ANALYSIS

IN the opening chapter we were concerned with mapping out the territory of non-perfect competition in domestic and foreign trade. The task is now done. Our next concern is to see how this territory can be systematically explored; that is, what kind of technique needs to be employed for investigating the problem of equilibrium and welfare under various conditions of market control in international trade. We are thus called upon to make an inquiry into the general principles of equilibrium and welfare analysis so as to define the method to be followed later on in investigating various models of trade under monopolistic, duopolic and oligopolic conditions.

i

Let us first clear up a preliminary issue of our inquiry: what is the meaning of cost?

It should not take us long to answer this question since the old debate regarding real cost versus opportunity costs may be regarded as settled, the ultimate nature of cost should now be considered a dead issue of economic methodology.[1] The accepted position is this. Costs reflect the valuations of individuals seeking to allocate available resources among rival opportunities which lie *open* before them. In the final analysis costs are the resultants of choice on the part of exchanging individuals. Hence they are to be computed not in terms of physical products, but only in terms of

[1] A full discussion of this topic will be found in Wickstead, *Commonsense of Political Economy*, Vol. I, ch. ix. Also Knight, *Risk, Uncertainty and Profit*, ch. i; 'Some Fallacies in the Interpretation of Social Cost' *Q. J. E.* Vol. XXXVIII (1924), pp. 592-6; Robbins, 'Remarks on Certain Aspects of the Theory of Cost' *E. J.* Vol. XLIV (1934), pp. 2-6.

values—preference ratios—set upon them by individuals. It is in this sense alone that they are real and can be said to lie behind the phenomena of money costs. Once this position is granted the dichotomy between absolute and comparative costs breaks down and the classical belief in pain and disutility as ultimate basis of cost has to be abandoned, for all costs have to be conceived as reflecting alternatives to be sacrificed while choosing this in preference to that or the other occupation. Now the great merit of the Ricardian doctrine of comparative cost is that, within the classical fold, it prepared the way for universal acceptance of the modern conception of cost. Though its exponents regarded it to be 'an apparent exception to the general tenor of economic theory' its true universality has now been recognized.[1]

Now the abandonment of the absolute—that is, the disutility—basis of the traditional doctrine has led some economists, Cassel, Ohlin, Angell among others, to deny the validity of the real cost approach altogether and to rely entirely upon money costs.[2] This is indeed to err grievously. Ricardo, it is to be remembered, explained 'the motive which determines us to import is the discovery of its relative cheapness: it is the comparison of its price abroad with its price at home'.[3] Yet he was very careful to show earlier how the price differences were based on labour cost differences. This is the important thing to keep in mind. Any theory of domestic or foreign trade, in order to be adequate, must penetrate beneath the outer surface of money prices to the

[1] F. A. Fetter, *Principles of Economics*, p. 218n. and Carl Iversen, *International Capital Movements*, p. 7.

[2] Gustav Cassel, *Theory of Social Economy*, pp. 7, 48-9; *Fundamental Thoughts in Economics*, p. 46 ff; Bertil Ohlin, *Interregional and International Trade*, pp. 13-21; J. W. Angell, *Theory of International Prices*, p. 463 ff. All these maintain that absolute *price* differences, and not comparative *cost* differences lead to trading between countries. The latter are the underlying forces which manifest themselves through the former. A brief but penetrating analysis of this issue is given by Haberler in 'The Theory of Comparative Cost once more' *Q. J. E.* Vol. XLIII (1929), pp. 377-80.

[3] *Principles*, p. 152.

inner forces of exchange expressed through them.[1] Although we might abandon the classical belief in pain and disutility and the hedonist assumptions on which it is rested, we must have in its place another foundation, sturdier than before, which can accommodate our theoretical constructions. Such a one is provided by the above-mentioned Opportunity Cost doctrine.

Haberler has carried out a re-orientation of the classical trade theory on the foundations provided by the above doctrine. He employs the 'substitution curve' to describe the relative cost conditions regarding commodities traded between countries. This curve 'follows the Austrian school in measuring cost not by absolute amount of labour required but by the alternatives foregone. Thus the marginal cost of a given quantity X of commodity A must be regarded as that quantity of commodity B which must be foregone in order that X, instead of X-1, units of A can be produced'.[2] Reconstruction on the same lines has also been attempted by Lerner and Loentief.[3] The former sets out cost conditions by means of Production Indifference Curves and demand conditions by Consumption Indifference Curves (abbreviated as *PIC*s and *CIC*s).

Though the foundations have been built afresh it must not be supposed that the structure of Ricardian and post-Ricardian theory has collapsed under the stress of this change. On the other hand it has remained intact in all essentials. The work which

[1]For a detailed discussion of this issue, see Jacob Viner, *Studies in the Theory of International Trade*, pp. 483-93. Viner's defence of labour-costs, that is pain-costs, cannot be tenable because they are absolute but not comparative in so far as direct comparison of such costs is not possible. Marshall had clearly recognized this difficulty, *Economics of Industry* (2nd. ed.), p 97, also 'Mill's Theory of Value' in *Memorials of Alfred Marshall*, p. 126, but showed no way out of it.

[2]Haberler, *Theory of International Trade*, p 177.

[3]A. P. Lerner, 'Diagrammatical Representation of Cost Conditions in International Trade' *Econ.* Vol. XII (1933) and 'Diagrammatical Representation of Demand Conditions in International Trade' *Econ. N. S.* Vol. I(1934); also Wassily Leontief, 'The Use of Indifference Curves in the Analysis of Foreign Trade' *Q. J. E.* Vol. XLVII (1933).

Haberler and Lerner have carried out has reinforced the traditional theorems on the subject. Shorn of 'the hedonistic trimmings of the works of Jevons and his followers' the classical thought in this field has furnished a valuable body of conclusions which can help us in analysing the various market situations.[1]

ii

In the theory of international value as formulated by Mill and Marshall trading relationships between countries are analysed with the aid of a single commodity or class of commodity assumed to represent their entire collectivity (of commodities) exchanged between countries. Mill's exposition is illustrated with cloth produced in England which is supposed to exchange against linen from Germany. He goes on to explain, 'if we now superadd coals or cottons on the side of England and wine and timber on the side of Germany, it will make no difference in principle'.[2] The reason for this is 'the produce of fifty days English labour whether in cloth, coals, iron or any other export will exchange for the produce of forty, fifty or sixty days German labour, in linen, wine, corn or timber, according to international demand'. Marshall devises the *E*- and *G*- bales which represent uniform aggregate investments of labour (of various qualities) and of capital.[3] Both these exponents and those who have followed their lead have thus taken recourse, for the international value problems, of grouping all traded commodities under one generic class. This procedure stands in contrast with that employed by them in domestic trade where the pricing of each particular commodity is analysed one at a time in isolation from all the rest. These latter are postulated to be parametric constants in individual

[1] As to the synthesis of classical and Austro-Laussane traditions, a convincing presentation will be found in Lionel Robbins', *Nature and Significance of Economic Science*, pp. 78-81, 86.

[2] *Principles*, p. 590.

[3] *Money, Credit and Commerce*, p. 157.

equilibrium equations. The reason for this divergence in procedure is plain. In international trade we are concerned with an economic nationality in its total exchange relationship with another and the goods that pass between one another have to be considered in their entirety. Hence the particular equilibrium method of analysis applicable to domestic trade theory is not serviceable for foreign trade theory.

The line of treatment which Mill and Marshall adopted made it possible to demonstrate that international trade is ultimately barter between countries—barter which, however, proceeds at competitive terms beyond the control of any party.[1] The equilibrium of exchange is determined by reciprocal demand for *all* exportable wares of one country in terms of all those of another. This is described by Marshall by means of his Willingness-to-Trade Curves. In these constructions costs are treated as implicit in the supply of exports, which make reciprocal demands effective.[2] Edgeworth's comment on the implication of this assumption is familiar: 'A movement along a supply-and-demand curve of international trade should be considered as attended with rearrangements of internal trade; as the movements of the hand of a clock correspond to considerable unforeseen movements of machinery.'[3] The movement of the exchange-index on the Marshallian curve indicates a relative variation of import and export prices reflecting shifts in the costs of employing factors in the export industries as well as home industries within the trading countries. Appropriate 'monetary changes are postulated by the movement of the exchange-rate, but the former are not regarded to be within the scope of pure theory of foreign trade. As Viner observes, 'the theory of international value takes for granted the existence of money and its execution of its respective functions, but confines its analysis to the

[1] A. L. Bowley, *Mathematical Groundwork of Economics*, pp. 5-7.

[2] For further discussion of this assumption see ch. iii, mod. A, sect. iii.

[3] *Papers*, Vol. II, p. 32.

non-monetary manifestations of the equilibrium process'.[1]

Consider now an objection brought against the interpretation of price-movements of imports and exports as indicating shifts in costs and consequently of real incomes of factors. It is argued that since the scales of preference of various individuals owning factors are different and hence not subject to direct comparison, it is illegitimate to assume that a change in the prices of goods—for instance that implied by a movement of the exchange-index of the Marshallian curve—would affect the real incomes of such individuals in an equal degree.[2] This is no doubt a valid argument. But the difficulty it presents can be overcome if we postulate that those individuals who are worse off in respect of their real incomes may be assumed to be compensated by proportionately taxing those who are simultaneously better off consequent upon the price-change. Differences in income elasticity of demand as between various individuals are smoothed out by fiscal methods. Thus the real incomes of all individuals taken together will remain constant over the transition. This is only a more precise mode of stating the classical assumption that marginal utility of money is constant for the community as a whole.[3] Fortified by the above reservation the assumption of constant marginal utility of money is admissible, and interpersonal comparisons of welfare can be based on changes in the level of import and export prices. It is usual to express the price-movements by means of the terms of trade. These are simply formulated as the index of relative change in import as compared to export prices

[1] *Studies*, p. 584.

[2] Robbins, *Nature and Significance of Economic Science*, pp. 59 ff; 'Interpersonal Comparisons of Utility- a Comment' *E.J.* Vol. XLVIII (1938). pp. 635-91.

[3] N. Kaldor, 'Welfare Propositions of Economics and Interpersonal Comparisons of Utility' *E.J.* Vol. XLIX (1939), pp. 549-52; 'A Note on Tariffs and the Terms of Trade' *Econ. N. S.* Vol. VII (1940), pp. 877-80; J. R Hicks, 'Rehabilitation of Consumers' Surplus' *R.E.S.* Vol. VIII (1941), pp. 108-16.

of commodities traded during two proximate years, or in a complex way as the index of relative change in factor earnings of those employed in making such commodities.[1] The simple average method usually employed is convenient in so far as it is based on the stochastic approach. Alternative formulations have been suggested which can overcome the limitations of the above approach. The essence of these, especially of the method of Ragnar Frisch, is to measure price movements for selected commodities the relative positions of which can be exhibited on the consumers' indifference maps.[2] Whatever be the method of compiling the terms of trade indices, they remain convenient shorthand measures of changes which reflect the movement of the Marshallian exchange-index. When we have many countries engaged in multi-angular trade, the complex of terms of trade will correspond to a network of exchange indices represented in a hyper-surface capable of being handled by algebraic analysis.[3]

iii

The traditional apparatus of equilibrium analysis concerning which a critical appraisal was attempted above deals with total trade situations. How far can it be employed for investigation into problems of trade under conditions of monopoly and imperfect competition ?

As shown in the last chapter section vi in the normal cases of trade monopoly and oligopoly the market control of the exporter is confined to an individual commodity. Within his own country as well as abroad,

[1]See Viner's *Studies*, ch. ix for the different versions of the terms of trade.

[2]Ragnar Frisch sets out his formulation in his 'Annual Survey of Economic Theory—The Theory of Index Numbers' *Econ.* Vol. IV (1936).

[3]R. G D. Allen ('The Foundations of a Mathematical Theory of Exchange' *Econ.* Vol. XII, 1932) describes the system of equilibrium equations for determining a 'liaison flat' built up from indifference loci and preference directions, pp. 216-18.

he operates in an environment of freer enterprise. He is concerned with demand prices in foreign markets and money costs at home. For him there arises a duality of demand schedule and supply schedule which is cardinal to the particular equilibrium analysis worked out in its manifold aspects in domestic trade theory. It follows that the technique of demand and cost curves has to be utilized for the analysis of his market equilibrium. In such trade situations the theorems formulated by Mrs Robinson and Chamberlin come into operation. Haberler has shown this in his treatment of dumping considered as a type of trade monopoly.[1] The same theorems are applicable to all types of foreign market control ranging from simple monopoly to oligopoly wherein the exporter is able to influence the price of his goods on the world market.

Yet it should be borne in mind that the individual exporter is only one of the many who are trading with the outside world. His particular industry is only a sector in the total trading economy. Its product forms part of the multitude whose reciprocal demand from the outer world binds one such national economy in exchange relationship with others. This total trade aspect can be handled by the Marshallian curves and it is a weakness of Haberler's treatment that it does not throw into relief the individual price-cost curves against the Marshallian integral curves. As a result his treatment of monopolistic trade reduces to that of internal trade. Unless the particular aspect and the total trade aspect were to be co-ordinated, that is unless the monopolistic and oligopolistic policy of an exporter were seen from the point of view of international trade, there is no point in regarding him a *foreign* trader.

[1]*op cit.*, pp 304-12.

iv

Our next task is to see how best this co-ordination can be brought about. As an ideal background we shall start with a competitive industry exporting its wares to the outside world and operating at home and abroad in an environment of perfect competition.

A competitive export industry is composed of a number of firms faced with a price ruling on the world market over which they can exercise no control. Acting as quantity-adjusters they carry out their short-run production plans by employing factors some of which are specific and others which are non-specific.[1] All factors are employed under diminishing marginal returns and their wages are equated to the marginal value productivities. The familiar theorems regarding price-cost equilibrium come into play. If there is a shift in the world demand for the product, the number of firms will expand or contract so that newer resources may be admitted or existing ones withdrawn from the industry. These shifts are manifested as price-movements in a single industry; yet because of the freedom of entry and exit of resources, these affect other industries. The demand curve of the particular industry is, on Edgeworth's analogy, one of the small wheels in the trading machinery of the country whose movements are recorded by means of the exchange rate.

This point needs to be carefully followed up. Suppose a particular export industry has come into a position of equilibrium at a given rate of exchange. There now follows a shift in the export demand for the product of this industry. Notice the effects of this shift on all other export industries. If there is a rise in the

[1]This distinction is made in the Wieserian theory of production. All fixed resources—natural or capital (augmentable and non-augmentable)—are treated as technical data which, though entering into the problem of imputation, are outside the scope of choice between free opportunities competing for the allocation of resources In other words such fixed resources are the parameters of the cost function. In his empirical study of production and distribution, *The Theory of Wages*, Paul Douglas approximates fixed capital to land and draws his production map on this assumption. See J. Marshak's review of the book, *Econ. N. S.* Vol. XIII (1936), pp. 224-5.

demand for the particular commodity, there will be an inflow of resources from other industries and, as a consequence, their supply prices would fall and the reverse effects will follow if there is a fall in the demand. Provided there is a smooth, unhindered inflow and outflow of resources from one industry to another, a shift in the demand of one commodity will cause a compensating shift, equal in its net magnitude, in the supply schedules of all other industries. Hence the disturbance in the individual equilibrium cannot bring about the consequential disturbance in the total trade of the country : as exchange-index will remain constant since the willingness-to-trade of this country with the rest of the world has undergone no change.

V

In this perspective of perfect competition let us now view the individual trader and the entire network of trade of his country under non-perfect competition.

Under both types of non-perfect competition, monopoly and oligopoly the individual firm is faced with a sloping demand curve. In the case of simple monopoly the seller has full control over the sale of his product and has not to reckon with the competition of substitutes. The factors will not be employed under the conditions of diminishing marginal returns since they are now subject to exploitation. To monopoly equilibrium the familiar theorems are applicable. Price is now held above marginal cost so that price is equal to $MC\ (\eta/\eta-1)$. Since the entry to the industry is closed, no fresh resources tend to be admitted with a rise in the demand nor will the existing resources tend to be readily withdrawn.[1] For this reason a shift in the demand for the monopolized product does not react on the competitive industries save for the inflow or outflow of factors which is

[1]The monopolist is not likely to reduce his supplementary costs in response to a downward shift in prices, though he may reduce the prime costs, while the perfect competitor has to do *both* under the pressure of increased demand for the specific and non-specific factors from other industries.

not specific to the monopolists' firm and can seek employment elsewhere on more profitable terms.[1] The shift does not cause a compensating variation *necessarily equal in magnitude* in the supply schedules of competitive industries. All the same any such shift will bring about a consequential disturbance in the exchange-rate and, by implication, in the willingness-to-trade of the country. Thus it follows that the monopolist is able to exert an influence on the trade economy of his country which the perfect competitor cannot. The monopolist demand curve may be a small part of the trading machinery of a country, but since its movements are not precisely counterbalanced by those of competitive demand curves, it can register its pressure on the exchange-rate and the total trade situation.

The above analysis can be readily extended to the oligopolist trader. The problem of oligopoly differs from that of monopoly in respect of the stability of equilibrium. The oligopolists have to anticipate mutual reactions and adjust their market policies accordingly and hence their price output policies do not necessarily arrive into a stable group equilibrium. Yet the group taken as a whole offers no freedom of entry to new sellers and for this reason any shift in the demand for the products of oligopolists, in like manner of the product of a monopolist, will fail to produce compensating shifts of equal magnitude in the supply schedules of competitive industries. The (anticipated) demand curves of oligopolists from a trading country exercise pressure on the exchange-rate in the same way as the monopolist demand curve does. Thus whether a trader is a monopolist or an oligopolist, once he is in control of his market he can

[1] It should be remembered that in a monopoly specific factors are bound to be in a greater proportion than non-specific factors Otherwise monopoly power would not be effective.

raise or depress his prices without allowing their full effects to be felt upon costs and prices outside his own industry, since he is now entrenched behind the closed entry. Yet there is no doubt that the disturbances in the exchange-rate caused by his price-policy can be analytically measured by the shifts of the exchange index on the Marshallian curve. Since shifts of the index are conveniently represented by those of the terms-of-trade index, the effect of a monopolistic or oligopolistic trade can be best studied by means of these indices. Now the analysis of demand and supply of products traded under non-perfect competition can be pursued by two stages. First we are concerned, as above, with the consequential effects of monopolists' or oligopolists' price-output policies on the trading economy of their own (exporting) country. Next our concern passes on to the counter-effects of these policies on the economy of the importing country. Whether the first or the second stage is under analysis, the Marshallian integral curves provide us with effective tools to disentangle the effects of non-perfect competition on the total trade of a country. By combining individual demand and supply-curves with the Marshallian curves we should be able to investigate any problem of equilibrium of monopolist and oligopolist trading in all its aspects.

vi

In examining the analytical technique requisite for the problem of trade equilibrium under monopoly or oligopoly, we have assumed in section v that they belong to the normal type. That is, we were concerned with a single-line monopoly as well as a single-line oligopoly. We should now turn to the exceptional type wherein not one but all export commodities are controlled by a central trading syndicate with the purpose of pursuing a monopolist or oligopolist policy.

Consider first the problem of centrally directed monopolistic trade. Here there is no longer any

distinction between a particular export monopolist and a number of competitors selling different products as defined in section iii. All traders are merely producers and there is only one seller, viz. the Export Trade Syndicate. It is this agency which estimates the willingness-to-trade of the country. The country's demand curve is given by the Marshallian Integral Curve and the Syndicate's power to influence the price would be manifested by charging that price for exports which it considers most profitable. In other words it will impose that rate of exchange on the importing country which maximizes profit. Since we are only concerned with the Integral Curves of the monopolist (export) country and the import country, our analytical technique is now simplified. This exceptional type turns out from the point of view of analysis to be the simplest case of monopoly.

Next turn to the oligopolic trading between a few countries of which one exports its products through central syndicate. The problem is equally simple. We now have two or three monopolist state-traders who base their price-output policies on the anticipated reactions of their rivals. Here also there is no longer a particular as distinct from a total trade aspect to each oligopolist. Since all export industries have lost their independent status but are now under the control of the Syndicate the problem can be investigated with the help of the Marshallian curves and only in respect of stability of equilibrium will the conclusions of this exceptional type of oligopolistic trade differ from the exceptional type of monopolistic trade considered in the above paragraph. It presents no fresh issue in respect of the technique of analysis.

Since these cases of state trading are exceptions to the general rule of private trading their analysis should be treated as curious.

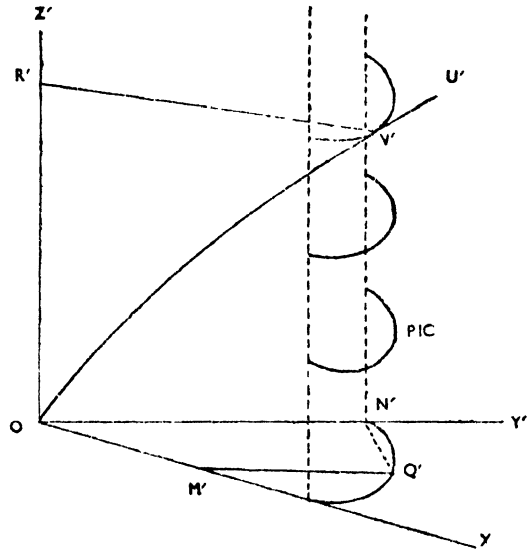
vii

This brings us to the end of the first part of our inquiry where we were trying to find out a suitable technique of equilibrium analysis. Let us now press forward to the second part wherein has to be set out an effective technique of gains-from-trade analysis.

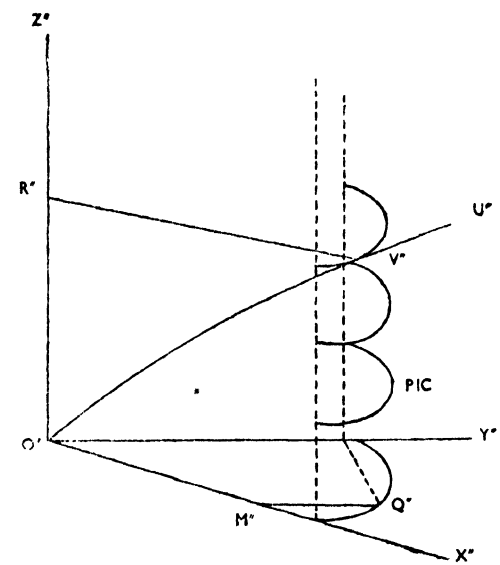
It is well known that the problem of welfare was the core of the classical theory which aimed at showing, in refutation of the Mercantalist dogma, that trading was to the mutual advantage of the exchange countries. Till Mill wrote his famous essay on International Values there was, however, no definite analysis of the measurement of gains.[1] The Marshallian apparatus helped to appraise the gains on the basis of consumers' surplus. Several objections well known to students of the subject have been brought against the basic concept. We propose to steer clear of them by adopting an alternative approach founded on the pure theory of choice with the help of which we shall reorient the classical propositions and further extend them from competitive to monopoly and oligopolic trading.

The primary concern of the classicists was to investigate how far a trading country was better off under trade as compared to no-trade position. Suppose a country A produces commodities X and Y under technical conditions set forth by its PIC in respect of the opportunities open for the investment of resources in one or the other competing lines. In the neighbourhood of A there is another country B which can also produce the same commodities under different technical conditions illustrated by another PIC. Both countries are closed economies and each consumes what it produces. The consumption of X and Y in A and B can be illustrated by means of the CICs of each. If these are ranged one over the other according to the total utility height measured along OZ,

[1] A critical survey of the doctrine of gains is made by Viner in his *Studies*, ch. IX.



(A)



(B)

FIGURE 1

we get a total utility surface with a contour OU. The equilibrium of internal trade in either country will be given by the tangency of PIC' with OU' for A and PIC'' with OU'' for B. This is shown in Fig. 1 (A) and 1 (B) whereby A produces OM' of X and ON' of Y for a total utility equal to OR' and B produces OM'' and ON'' of the two commodities for OU''. Now assume A and B to enter into trade with each other. Their PICs can now be compounded, and the utility surface of one may be set against that of another. Thus in Fig. 2(A) we have the utility surfaces facing one another each drawn in three dimensions. Next in Fig. 2 (B) the contours of the surfaces are shown in a plane giving us the familiar Willingness-to-Trade Curves of Marshall.[1] The equilibrium of trade is now attained at a point P and OP is the exchange-index. If this index is drawn as a tangent to the compound PIC of A and B at I we shall find that OQ of X and OV of Y are produced by A and Y by B which possess comparatively greater productive efficiency in the making of the respective product.

The gain which either country reaps from trade can be found from reading from the above curves how much of Y demanded by A in return for X supplies to B is relatively greater than the quantity of Y formerly produced in substitution to X in the same country. Hence A's gain will be written down as $\frac{OQ\text{-}OM'}{OV\text{-}ON'}$ and B's gain as $\frac{OQ\text{-}OM''}{OV\text{-}ON''}$.

These gains will represent the *total* increase in welfare of all those who are employed in the production of X in A and Y in B. The same principle will hold even if A produces many commodities such as p, q, r and similarly B produces l, m, n. Either country will gain from the production and export of these goods under conditions of competitive equilibrium and hence optimum welfare would be ensured for both of them taken together.

[1] Lerner, loc. cit., *Econ. N.S.* Vol. I (1934).

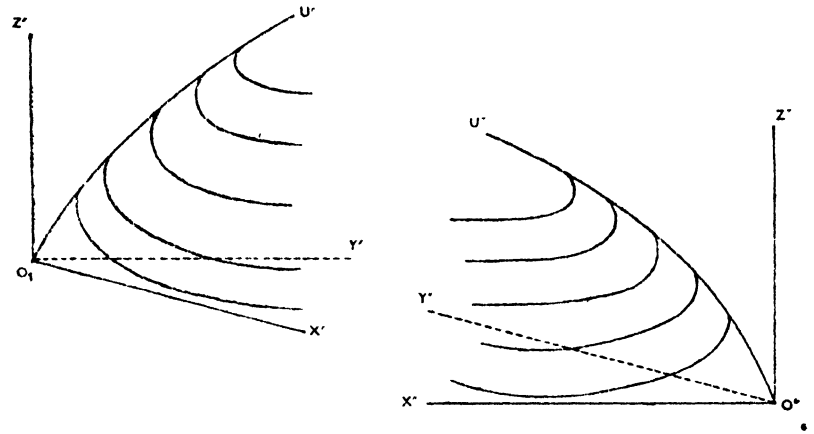


FIGURE 2A

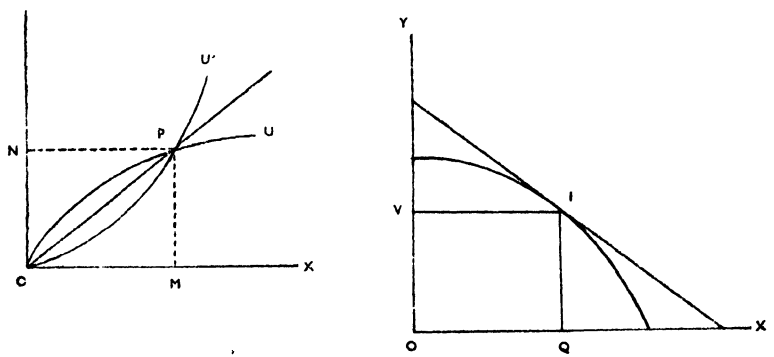


FIGURE 2B

Now assume that one of the commodities, let us say r, is monopolized. There is no more freedom of entry into the industry and hence no normalcy of profits as under perfect competition. The effect of monopolistic price policy in r on the total trade of A may be examined by the method discussed in sections iv-v. The monopolistic restriction of output is bound to reduce the gains from trade to B which could be

secured under perfectly competitive trading, while this reduction of gains to B may react on the gain to A as a whole country. From the angle of economic welfare the problem takes this shape : how does the monopolization of a single commodity affect the trading gains of (a) the whole country, let us say A, and (b) the entire world, say A and B taken together ?

Here arises the distinction analogous to that made by Professor Pigou in the context of national welfare between (a) marginal private as distinguished from marginal national net product of the rth resource monopolized for trade ; (b) marginal national as distinguished from marginal international net product of the same resource under the same condition. From the point of view of a country the gain from trade is increased when the national net product of the resource is greater than its private product to the monopolist, both being marginally considered. Similarly from the point of the world increase in gain is ensured when the international product is greater than the national product again considered at the margin. When the world is a gainer it is obvious a country must be necessarily so ; but the converse of this is not necessarily true. That is to say, a country may gain at the expense of the world and in the same manner, a private monopolist at the expense of his country as a whole.

Thus the appraisal of welfare from trade either to a country or the whole world can be properly made with the aid of these various products. A divergence between them is reflected both in the movement of terms and the volume of trade. A critical treatment of the conditions under which the products diverge in monopolistic and oligopolic trade can only be undertaken after the models of these have been built up and explored. (See ch. v, sections ii and iii).

In the analysis of welfare it is usually argued that the monopolistic (and also oligopolistic) price is higher and output smaller than the perfectly competitive

price and output respectively. This is valid only if the productivity functions of various factors are the same under the two types of conditions.[1] In that case there would be a reduction of exports of, let us say, r from A to B and a rise in price of r. This might react favourably on the exporters of p and q if their prices also rose (in other words, A's terms of trade became favourable); or unfavourably on these exporters if the prices fell. In the former case not only the private net product but also the national net product has increased. In the latter case, however, there is only an increase in the private net not in the national net product. Yet in either case the international net product is bound to decrease because of the restrictionist policy of the monopolist r.

The restrictionist effects of monopoly should, however, be set off against the concentration of resources and the consequent operation of diminishing costs. Capital intensity has now increased, larger economies are now reaped partly by the integration and partly by innovations, the export price of the monopolized product r may now be lowered and under normal conditions its import demand from B would expand. In this case the exporters of other products are likely to benefit from this fall in price and the consequent increase in demand for other exports from A. Here is a situation in which the monopolization of r would mean not only a (monopoly) gain to its exporters but a gain to the country A as well as B. Thus in this instance all the three products—private, national and international—have increased. These effects can be similarly measured by means of the Integral Curves.

The welfare comparisons between the three types or products can be made with the aid of the terms of trade, that is, the exchange-index of the Integral Curves. Yet while taking their aid, it must be remembered that *by themselves* they cannot serve as reliable guides of gains or losses. They should be considered with re-

[1] *Post* ch. iii, model C, sects. iii-iv.

ference to Integral Curves, that is the utility functions, of the trading countries. The trading terms are only a description of equilibrium which under fully competitive conditions alone can imply optimum welfare.[1] A disturbance from the optimum position can be properly analysed by means of the utility apparatus.

viii

There remains to be examined the problem of gains in relation to imperfect competition proper. The welfare effects of the transition from many sellers (polypoly) to a few sellers can be investigated on the same lines as indicated above. Yet there arises now a special problem—the transition from oligopoly to monopoly. As we saw in the last chapter oligopolic equilibrium is unstable save under special hypotheses of rival reactions. The instability can often be remedied by tacit or open agreement, or else by combination usually in the shape of amalgamation.[2] Now this transition may be beneficial to consumers provided that the withdrawal of competing varieties does not reduce their satisfaction, but instead curtails production costs and selling expenses and thus lowers the prices.[3] The welfare effect will be the same as that which monopolistic control brings with its economies and innovations. The national net product and international net product are raised in the above instance.

But it would be certainly false to conclude from the above argument that the replacement of imperfect competition by monopoly is socially more beneficial than the replacement by perfect competition or even a

[1]F. C. Benham argues ('Terms of Trade' *Econ. N.S.* Vol. VII 1940) that the terms of trade is a concept without any usefulness in the absence of further data. It may be pointed out that unless there is accompanying data as regards costs and demand conditions in non-optimum situations the concept should not be used for drawing positive or welfare conclusions.

[2]This problem of instability is explored with the aid of a specially built-up model in ch. iv, mod. C.

[3]R. F. Kahn, 'Notes on Ideal Output' *E.J.* Vol. XLV (1935). Also Hicks, 'Foundations of Welfare Economics' *E.J.* Vol. XLIX (1939).

close approximation to it. As we saw in the first chapter market perfection requires a free flow of resources from one line of employment to another. In fact this can be secured by potential competition, that is to say, pliopoly. Without this market control can never be combated and the norm of equality between marginal cost and price cannot be realized as under a system of free enterprise. It follows, therefore, that the general welfare of consumers will be increased when there is greater competition in all those industries where more than one or a few producers can operate—that is to say, where monopoly or oligopoly is not by technical conditions a social gain. The transition from oligopoly to monopoly can at best be relatively beneficial only when the concentration of resources in a single concern to the exclusion of its rivals ensures higher productivity beneficial to the community as a whole.

We have to recognize that the most important obstacles to free flow of resources is 'lumpy' investments which in all heavy industries set technical restrictions on freedom of entry. If more sellers are admitted overheads become a disproportionately large item of costs as compared to the ruling prices, and insurance against the risk of price fluctuations provided by excess capacity becomes perilously low.[1] Here monopoly may be more *efficient* than oligopoly, or at least a smaller degree of oligopoly more so than a higher degree. The purpose of *just* competition can be served in this case provided monopolistic sellers operating under diminishing costs are induced to enlarge their output by payment of bounties, but made to sell their output in foreign markets at marginal cost. This is, of course, the well-known argument of Marshall and

[1]Excess capacity may be considered as a necessary reserve against the uncertainty of price-changes, but if there is a relatively greater number of oligopolic sellers, they will all maintain the overheads in order to provide for uncertainty, and the net 'social' cost of this will be relatively higher than when the oligopolists were few or when only a monopolist remained in control of the market.

Pigou, an exhaustive re-examination of which is made by Hotelling.[1] As applied to international trade, it would require bounties to be paid by importing countries to the diminishing cost industries. In all cases of this sort the interests of economic efficiency and justice can only be reconciled by such a fiscal policy.

[1] 'General Welfare in relation to Taxation and Railway Utility Rates', *Econometrica* Vol. VIII (1938), pp. 242-69. The argument of this paragraph proceeds on the lines of Hotelling's paper.

CHAPTER III

MONOPOLISTIC TRADE

MODEL A

i

So long as foreign trade is confined within the bounds of perfect competition its features are simple and clear-cut such as to offer a great deal of analytical convenience. But as trading passes into the region of monopoly and further on into that of monopolistic competition, those rigid features exist no more. Trading is not of one but many types, for there arise various possibilities of market control discussed in the opening chapter. We are, therefore, faced with a choice of assumptions ranging widely in complexity and realism. In this chapter we propose to explore select problems of monopolistic trade each based on assumptions which should lead us nearer, step by step, to the facts of the real world.

Let us start with the simple problem of bilateral trade which promises to yield readily to Marshall's apparatus of Willingness-to-Trade Curves. Two countries, for instance, England and Germany have been trading in two classes of goods *E*-bale and *G*-bale under competitive conditions. Now England becomes a monopolist of her entire export goods. How will this affect the trade situation in either country? In what way, to put it in precise terms, will equilibrium of trade be brought about, and how will the gains from trade be distributed as between the countries? These are the questions we seek to answer.

ii

As a monopolist of export trade England comes to have the power to control the price or output of *E*-goods. It is a necessary implication of such power that there should be a single sales agency which can formulate

and carry out policy as to price and sales, thus unifying or co-ordinating the whole structure of production. This condition will be satisfied by England if there exists in that country a Central Export Trade Syndicate or any similar agency which has taken over control of sales and output from private and independent firms hitherto trading with German importers as so many competitors. England's export monopoly may belong to one or the other of these two types: (a) the *E*-good industries produce goods which form a large share of the total supply of England and Germany. This means that German consumers have to depend very largely on English exports. If the *E*-bale industries are operating under decreasing cost, this dependence will become greater. Or (b) *E*-bale resources are exclusively located within England and German deficiency in regard to them puts her entirely at the mercy of English supplies for domestic requirements. To this class belongs the raw material monopolies. We shall find, as we proceed, that both the types are almost coincident from the point of view of analytical significance and that their effects on foreign trade are identical save for minor reservations.

iii

Coming back to Marshall we find his *E*-bale curve presumes 'a knowledge of England's demand for linen, what is the number of yards of cloth, the expenses of producing and exporting which will be covered annually by the proceeds of sale in England of an amount of linen represented by (a certain quantity) *ON'*;[1] the same applies to Germany. Thus each country's demand for imports and supply of exports are represented on the same curve. There is no separate supply curve in his constructions. This was introduced by Edgeworth, and is called a Curve of Constant Advantage or 'Indifference Curve'.[2] If such a one were separately

[1] *Pure Theory of Foreign Trade*, p. 7.

[2] *Papers* II, p. 33.

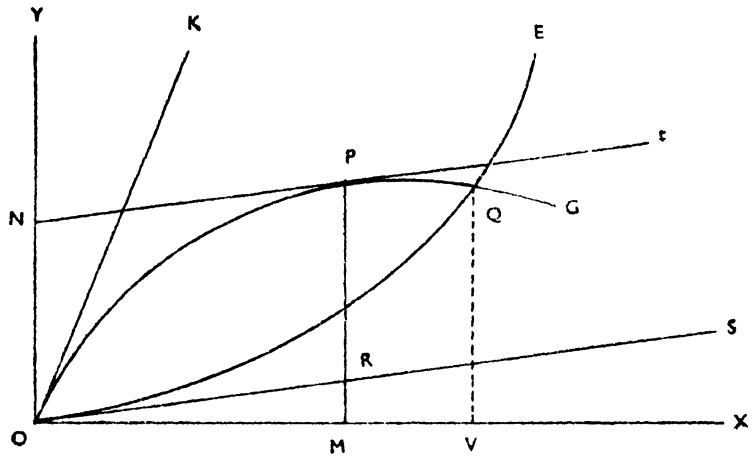


FIGURE 3

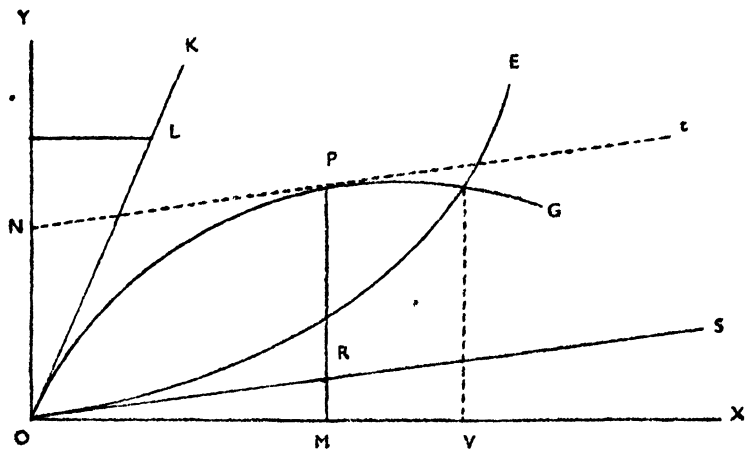


FIGURE 4

drawn to exhibit conditions of cost of producing exports, *OE* or *OG* would then reduce to an Offer or Consumption Indifference Curve of the respective country. It would cease to stand jointly for demand and supply of *E*- or *G*-bale as in Marshall, but only represent the bargaining locus of either country based on its utility functions.[1] For our part Edgeworth's refinement is indeed welcome, because the supply (cost) curve is essential to the analysis of monopoly and in its absence Marshall's apparatus cannot serve our purpose.[2] *OS* is therefore superimposed on *OE* and *OG* in the constructions that follow.

iv

When England comes to have a monopoly of export trade, Germany can no longer have the rate of interchange between *E*-bale and *G*-bale settled by the action of competitive bargaining. The rate will be so fixed by England that marginal costs to her of export of *E*-bale in terms of *G*-bale is equal to her marginal revenue from the import of *G*-bale in terms of *G*-bale. In this connexion marginal revenue of England from her foreign trade is defined as the quantity of *G*-bale imports obtained from Germany as a result of a very small change in the terms at which England offers her exports to Germany. Similarly marginal cost to England of her exports means the quantity of *G*-bale whose production has to be foregone by England for a very small change in the output of *E*-bale actually produced for export.

The mechanism of equilibrium of Anglo-German trade can be illustrated by Figs. 3 and 4. *OE* and *OG* are the offer curves of England and Germany. Under free competition equilibrium is atained at *Q*, so that England exports *OV E*-bale in exchange for *OV*

[1] See A. L. Bowley, *Mathematical Groundwork*, p. 6.

[2] The consequential effect of monopoly can be shown on the Marshallian apparatus by means of the upward shift of the *E*-bale curve, but the degree of this shift cannot be determined without additional data This is provided by the *OS* curve of England

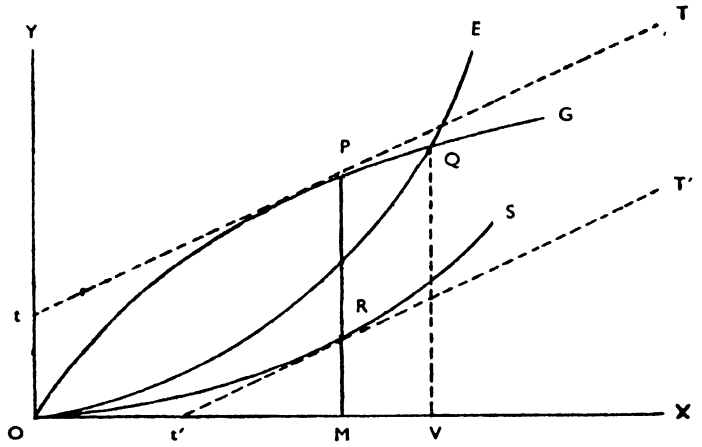


FIGURE 5

INCREASING (MARGINAL) COSTS

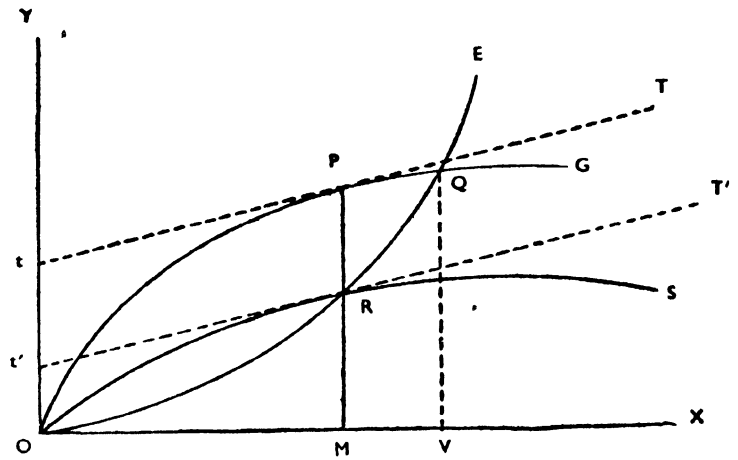


FIGURE 6

DECREASING (MARGINAL) COSTS

G-bale from Germany. When *E*-bale is monopolized, England tries to maximize her revenue from monopoly by equating marginal cost with marginal revenue. Let *OS* be the total cost curve for *E*-bale manufactured in England and *OK* for Germany. Suppose, in the first instance costs are constant to scale and hence *OS* and *OK* are straight lines with their origin at *O*. Draw a tangent *NT* to *OG* at *P* so that *Nt* is parallel to *ORS* and hence the gradients of *OG* at *P* and *OS* at *R* are equal to one another. But *OG* is concave from below while *OS* is a straight line. Therefore $dR/dx = d\pi/dx$ and $d^2R\ dx^2 > d^2\pi/dx^2$ where the total revenue function is $R = x\phi(x)$ and the total cost function is $\pi = F(x)$.[1]

It needs to be observed that when Germany has a slight capacity for *E*-bale production at home, the *OG* curve will rise up to a point *L* and from there it will fall below towards *OY*. The monopoly terms will fall within the limits set by comparative costs of producing *E*-and *G*-bale so long as the exchange index does not raise goods of the two countries beyond the height of *L* from the *X* axis. In Fig. 3 the index settles at *P* which is higher than *L*. The terms of trade will therefore be *OM* units of *E*-bale in exchange for *MP* units of *G*-bale.

V

The cost of producing *E*-bale goods in England may not be constant as assumed above: it may rise or fall according to scale. We pass on to analyse these possibilities. Figs. 5 and 6 show increasing and decreasing average costs in English export industries. Monopoly equilibrium is attained in the same manner as before. In each figure, the tangent $t'T'$ at *R* on the cost of curve *OS* at *N* is parallel to the tangent *tT* at *P* on the trade revenue curve of England (offer curve of Germany *OG*). Hence $dR/dx = d\pi/dx$. Since

[1] See R. G. D. Allen, *Mathematical Analysis for Economists*, pp. 196-8

OG is more concave from below at *P* than *OS* is at *N*, $d^2R/dx^2 > d^2\pi/dx^2$. The monopoly exchange index settles at *P* and *PM* *G*-bale goods exchange for *OM* *E*-bale goods. The exports of *E*-bale will contract from *OV* to *OM* as England passes from competition to monopoly. The terms of trade will move away in favour of England and against Germany. When the scale of returns is increasing the trade equilibrium will, however, be unstable and hence the terms of trade will tend to fluctuate. If considerable economies are reaped in *E*-bale industries the terms will be less unfavourable to Germany; that is, the price of *E*-bale will tend to be lower.[1]

vi

From the results so far reached it is now possible to examine the question of gains from trade to either country. A primary consideration may first be set down. If Germany is totally deficient in *E*-bale resources, she will benefit from trade with England in so far as she can now acquire *OM* *E*-bale by trade with England which could not otherwise be available to her. English imports will add to the variety of goods available to German consumers and thus raise their standard of living. These will possibly aid the German home industries. Such benefit will be reaped even if she was capable of making *E*-bale goods to a small extent. But all this is an absolute gain which cannot be measured on our curves. England's gains from monopolization can, however, be measured in definite terms. She sends out *OM* *E*-bale in return for *PM* *G*-goods. As shown by her supply curve *OM* *E*-bale cost her as much as *RM* *G*-bale. Her monopoly revenue therefore is equal to *PM*-*RM* or *PR* *G*-bale. In free competition England would get *QV* *G*-bale for *OV* *E*-bale, but under monopoly she obtains *PM*

[1] As in domestic trade so in foreign trade the operation of increasing returns may lead to the establishment of monopoly. After it is established its equilibrium will be unstable if the economies of large-scale industry operate.

G-bale for only *OM* *E*-bale. The relative fall of imports of German goods in England is smaller than those of English exports to Germany, that is $\frac{QV-PM}{QV} < \frac{OV-OM}{OV}$. England's monopoly gains *PR* *G*-bale is unaffected by Germany's capacity to produce *E*-bale at home.

The total volume of trade declines as a result of *E*-bale monopoly. This is obvious from the fact that $OV + QV < OM + PM$. As a rule there will be greater contraction under increasing than under diminishing costs. Whatever may be the degree of contraction of English exports, it will release resources from her export industries which may be more profitably diverted to home industries.

vii

The conclusion obtained with the aid of Marshallian technique can be confirmed by means of the Indifference Curves.[1] This approach is to some extent implicit in Marshall, for the Offer Curves of England and Germany are in fact the loci of points at which bargains are offered by one country to another in her export market at competitive ratios of exchange. Now it is the primary condition of perfect competition that neither England nor Germany can control the exchange ratio at which the bargain is finally struck, while monopoly implies such control. Competitive equilibrium is reached at that point where highest Consumption Indifference Curves (*CIC*s) of England and Germany will touch each other. When the former becomes a monopolist, she will maximize her revenue from trade by taking that offer of Germany which is most advantageous to her. In Fig. 7 this point of equilibrium is indicated at *P* at which C_4 one of the *CIC*s touches *OG*, the bargaining locus of Germany. The two curves are tangential at this point and hence have the same gradients and their equations the same differential coefficient.

[1]See A. P. Lerner, *Econ. N.S.* Vol. I (1934) and ch. ii, sect. 1 for this method of analysis.

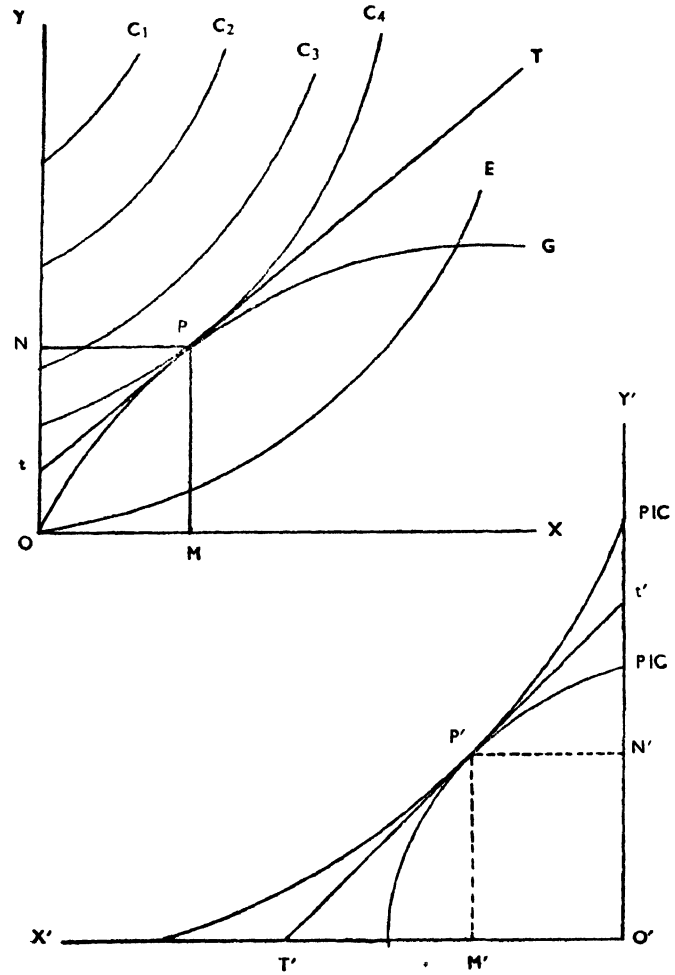


FIGURE 7

CONSUMPTION INDIFFERENCE CURVES AND
PRODUCTION INDIFFERENCE CURVES OF ENGLAND AND GERMAN'

The two conditions of monopoly equilibrium are described on the diagram by means of the Production Indifference Curve drawn on axes parallel to OX and OY. Costs are shown to be either rising, falling or constant according to scale. The tangent $t'T'$ to the PIC at P' is parallel to tT which is tangential to OG and C_4 at P. OM is equal to OM'. Moreover the cost curve is more concave to $O'X'$ than C is to OX. Thus both the conditions of monopoly equilibrium are fulfilled.

England may not choose to exact maximum monopoly revenue by imposing on Germany the terms OM E-bale to PM G-bale. It will probably follow this policy from fear of cheap substitutes being made in Germany. Moreover prices lower than monopoly ones usually bring about an increase in demand. In the long run 'a monopolist may often find it to his ultimate advantage', observes Bowley, 'to encourage his customers by not exacting the uttermost farthing'.[1] If this is so, the monopoly price of E-bale will lie between $\frac{PM}{OM}$ and $\frac{QV}{OV}$; that is, the exchange index will settle between P and V.

viii

It remains to appraise the effects of hindrances such as transport cost, customs duties and bounties on Anglo-German trade under monopoly conditions. Here our task turns out to have already been done. For whatever results Marshall worked out in respect of competitive trading they have to be extended, without qualification, to the field of monopoly. For instance, transport costs may be interpreted to be inclusive in production costs, as he does[2] or else they may be regarded as giving rise to upward shifts in England's Offer Curves. Since the shift is uniform at all points of the curves, their elasticity will not be

[1] op. cit., p. 25.

[2] *Pure Theory of Foreign Trade*, p 2 and *Money Credit and Commerce*, p 326-8

affected when they are redrawn. In the same way, bounties may be taken to produce downward shift in the above offer curve. When all such changes in the conditions of demand or supply are taken into account our conclusions will need to be reoriented to Marshallian theorems and no departure from them is warranted. From these we already know that the incidence of taxes imposed on traded goods will be distributed between England and Germany in the inverse ratio of their elasticities of demand. There is considerable possibility that German authorities may levy import taxes on English goods, with the consequence that their burden would mostly fall on German consumers. Yet if these taxes are small and English authorities do not retaliate, the terms of trade are likely to move somewhat in favour of Germany.[1] In this connexion it is necessary to note that the German authorities would do well to levy *income* taxes on the consumers of German goods rather than *excise* taxes on goods. For the former are more economical, and less injurious to the consumers' interests.[2]

Model B

i

The situation becomes more complex when more than two commodities enter into bilateral trade and one is assumed to be monopolized. We now have English and German traders exchanging n different commodities each with a demand function of its own. In the regime of free competition England exported a to g commodities in return for k to n from Germany. Now England has monopolized export trade in commodity g, though all the rest are still traded under competitive conditions.

[1] N. Kaldor, 'A Note on Tariff and the Terms of Trade', *Econ. N. S.* Vol. VII (1940), pp 377 ff.

[2] This problem is fully analysed by Hotelling, 'The General Welfare in relation to Problems of Taxation etc.', p. 242 ff.; also *Econometr.* Vol. VI (1938); Ragnar Frisch and Hotelling, 'Discussion on the Dupuit Theorem', *Econometr* Vol VII (1939), pp 145-60.

ii

Plane Geometry cannot serve the analysis of this situation, for the variable quantities are more than two. We have therefore to make use of the differential calculus for investigating into their interrelations. Yntema's work in this field provides a useful starting point.[1] He formulates two identities and three equations, the latter mainly in the nature of definitions concerning equilibrium of competitive trade. In simple words, these identities mean that (i) for each country the sum of values of goods imported (−) plus the sum of values of goods exported (+) is zero. (ii) for each commodity the sum of the quantities exported (+) from all countries plus the sum of all quantities imported (−) into all countries must be zero.

In the context of Anglo-German trade the identities will be written in the Yntema notation as in the following manner.[2]

First, the equality of values of imports into and exports from England to Germany :

$$x_{Ea}\, y_{Ea} + x_{Eb}\, y_{Eb} + x_{Ec}\, y_{Ec} + \ldots x_{En}\, y_{En} = 0 \quad \textit{YNT. EQ. 14}$$

or, in summation form

$$\sum_{E=a}^{E=n} x_{Ei}\, y_{Ei} = 0$$

There will be two such identities one for England and another for Germany.

Second, identity of imports and exports of a commodity to and from England :

$$x_{Ea} + x_{Ga} = 0\,;\; x_{Eb} + x_{Gb} = 0\,;\; x_{Ec} + x_{Gc} = 0\,;$$
$$\ldots\; x_{En} + x_{Gn} = 0\,. \qquad \textit{YNT. EQ. 15.}$$

[1] T. O. Yntema, *A Mathematical Reformulation of the General Theory of International Trade.* All references to Yntema pertain to this book.

[2] Yntema calls them equations, but they are in fact identities. See J. Marshak, 'Identity and Stability in Economics' *Econonet.* Vol. X (1942).

iii

In the first equilibrium equation[1] it is established that changes in monetary conditions shift all the demand and supply schedules of a country upwards or downwards by some ratio which is the same for all commodities. Thus if Y_{Ej} and y_{Ej} are actual prices under different conditions, the ratio of the prices is a measure of shift in the heights of the demand schedules of j in England due to monetary changes.

$$r_E = Y_{Ej}/y_{Ej} \quad (j = a,b,c, \ldots g) \quad Y_{NT.\ EQ\ 16}$$

There will be a similar expression r_G for Germany.

Secondly, the exchange ratio between England and Germany measures the number of units of foreign currency obtainable for a unit of home currency. Thus c_G^E and c_E^G are English and German ratios.

Since prices of internationally traded goods are the same in both the countries, it follows that

$$Y_{Ej} = Y_{Gj}\, c_E^G \quad (j = a,b,c, \ldots g) \quad Y_{NT.\ EQ.\ 19}$$

Next we consider the price and output of the monopolized commodity g. Yntema says 'a simple functional relation between the quantity offered by a monopoly and its price does not exist', and hence he drops out the competitive equation between output and price. Instead he substitutes six equations of which the first three read as below in the present context:

$$Q_{s,Eg} - Q_{d,Eg} = X_{Eg} \qquad Y_{NT.\ EQ.\ 55.}$$

$$Q_{d,Eg} = y_{d,Eg} \qquad Y_{NT.\ EQ.\ 56.}$$

$$Y_{c,Eg} = f_{Eg}\,(Q_{s,Eg}) \qquad Y_{NT.\ EQ\ 57.}$$

[1]The following are the symbols used in these equations:
X = Quantity of a commodity exported (+).
Y = Actual money price
y = Deflated or fixed height schedule price
Qd = Quantity demanded.
Qs = Quantity supplied.
E, G refer to countries as for instance England and Germany.
$a, b, c \ldots n$ refer to commodities.
$\imath$ refers to summation.
d refers to demand.
s refers to supply.

The remaining three hold good only when the monopolist country can discriminate between markets. Since England has a single export market these equations will not apply to the present situation. Stable monopoly equilibrium requires that marginal cost should be equal to marginal revenue for the output produced and the rate of fall of the marginal revenue should be greater than that of the marginal cost for the same output.

Thus in the present instance England's trade in the g good with Germany will reach a position of equilibrium provided that

$$\frac{d\,(\,Y_{C,\,Eg}\,x_{Eg}\,)}{d\,Y_C} = \frac{d\,(\,x_{Eg}\,y_{Eg}\,)}{d\,x_{Eg}}$$

Differentiating the above we get

$$f_{Eg}\,(\,Q_{s,\,Eg}\,) + Q_{s,\,Eg} f'_{Eg}\,(Q_{s,\,Eg}\,) = \psi_{d,Eg,}\,(\,y_{Eg}\,) + y_{Eg}\,\psi'_{d,\,Eg}\,(\,y_{Eg}\,)$$

Next the second order condition requires

$$\frac{d^2}{d\,x^2_{Eg}}\,(\,x_{Eg}\,y_{Eg} - Y_{c,\,Eg}\,Q_{s,\,Eg}\,) > o$$

The price of a monopolized commodity is related to its elasticity of demand by the formula:
$AR = MR\,(\eta/\eta\text{-}1)$ (See ch. i sect. iv)

Hence we have

$$y_{Eg} = \frac{d(\,x_{Eg}\,y_{Eg}\,)}{d\,x_{Eg}} \left[\frac{\dfrac{y_{Eg}}{x_{Eg}}\,\dfrac{dx_{Eg}}{dy_{Eg}}}{\dfrac{y_{Eg}}{x_{Eg}}\,\dfrac{dx_{Eg}}{dy_{Eg}} - 1} \right]$$

which can be simply written thus

$$y_{Eg} = \frac{d\,(\,x_{Eg}\,y_{Eg}\,)}{d\,x_{Eg}} \left[\frac{\eta_{Eg}}{\eta_{Eg} - 1} \right]$$

Where η_{Eg} is the measure of the elasticity of demand for the commodity g.[1]

iv

The transition from competition to monopoly in English export trade in the g goods will be attended with changes in her terms of trade which we must now analyse. Let us assume that monopolization of g does not affect the cost ratios of all the other goods exported by England or Germany, and therefore the direction of trade remains unchanged in the new situation.

Since the monopoly price of g has risen above competitive price and its demand elasticity diminished the total value of g exports will decline below the former level. Thus there arises a disturbance in the balance of trade in England characterized by an excess of imports over exports. It may be corrected and equilibrium restored by a lowering of the English exchange rate which signifies a fall in purchasing power of England, in other words, a decrease in English demand for German goods. As a result, the volume of trade will be reduced below the competitive level.

The two positions of trade equilibrium as seen from the English angle can be described by the following equations.

When competition prevailed all through Anglo-German trade

$$x_{Ea}\, y_{Ea} + x_{Eb}\, y_{Eb} + \ldots\ldots + x_{Eg}\, y_{Eg}$$
$$= x_{Gh}\, y_{Gh} + x_{Gi}\, y_{Gi} + \ldots + x_{Gn}\, y_{Gn}$$

After monopoly has set into the g export trade of England

$$x'_{Ea}\, y'_{Ea} + x'_{Eb}\, y'_{Eb} + \ldots + x'_{Eg}\, y'_{Eg}$$
$$= x'_{Gh}\, y'_{Gh} + x'_{Gi}\, y'_{Gi} + \ldots + x'_{Gn}\, y'_{Gn}$$

[1] This is reflected in the elasticity of (total) demand for English imports into Germany. cf. Marshall, 'The elasticity of a country's aggregate demand for foreign goods is compounded of the elasticities of her demands for various sorts of goods · account being taken of the time required for an increased demand to effectuate itself'. *Money, Credit and Commerce*, p. 175.

The dashes on X's and Y's indicate changes in the prices and quantities resulting from monopolization of g, it being assumed that the rise in g price is spread over all other prices of a to f goods exported by England and also affects k to n goods imported from Germany. This assumption, it will be seen, rests on the concept of single price level of traded goods, that is the 'A' of Harrod.[1] The change in English and German price-levels will be a real or uncompensated change, that is,

$$\frac{\gamma'_E}{\gamma'_G} \cdot \frac{E}{G} \neq 1$$

$$\frac{\gamma_E}{\gamma_G} \cdot \frac{E}{G}$$

The English terms of trade, as also the German terms, will react to these price level changes. This is indicated by the following expression

$$\frac{y'_E\,(a \longleftrightarrow g)\ /\ y_E\,(a \longleftrightarrow g)}{y'_G\,(k \longleftrightarrow n)\ /\ y_G\,(k \longleftrightarrow n)}$$

And the relative favourableness or otherwise of English trade terms will be shown by

$$\frac{y'_E\,(a \longleftrightarrow g) - y_E\,(a \longleftrightarrow g)\ /\ y_E\,(a \longleftrightarrow g)}{y'_G\,(k \longleftrightarrow n) - y_G\,(k \longleftrightarrow n)\ /\ y_G\,(k \longleftrightarrow n)}$$

The first expression will be greater than unity and the second will be positive provided Anglo-German trade belongs to the 'normal class' of Marshall.[2]

The familiar theorems of Marshall on the favourableness of trade as determined by elasticity of recriprocal demand have to be invoked in this connexion.[3] The more elastic is England's demand for German imports, the reciprocal demand elasticity of Germany being

[1] *International Economics*, p. 60-2.

[2] The validity of the Marshallian proposition was questioned by Graham, 'The Theory of International Values' *Q.J E.* Vol. XLVI, (1932) and Viner lent support to some of Graham's criticisms (*Studies*, p. 543 ff.). Marshall has been proved to be right by D. H. Robertson, 'Changes in International Demand and Terms of Trade' *Q. J. E.* Vol. LII, (1938), and A. K. Das Gupta, *Conception of Surplus in Theoretical Economics*, pp. 156 ff.

[3] *Money, Credit and Commerce*, p. 178.

given, the less favourable will the terms of trade be to England.

V

The analysis pursued in the preceding section takes no account of the principal factor that tends to check the adverse movement of the terms of trade: the substitution of imported goods by home-made goods. When import prices begin to rise and imports fall off, the consumers begin to substitute home goods for foreign goods in their budgets. But though the former will be substituted as the prices of the latter rise higher, every increase in the rate of substitution will make further increase in it more and more difficult. This can be seen from the normal shape of preference curves which are convex to the origin.[1] What concerns us here is that the relative ease or difficulty of substitution of imports which may be termed as the elasticity of import substitution tends to offset the unhindered movement of terms of trade. In considering the effects of monopolization of *g* on Anglo-German trade as a whole we have therefore to balance the elasticity of import substitution against that of reciprocal demand as defined by Marshall and calculate the net or aggregate result of the two. This we propose to call the net substitution effect defined as a ratio of the elasticity of substitution and the Marshallian elasticity.

Although no more than a refinement the concept serves to confirm and supplement Marshall's findings about favourableness of trade.[2] The greater the net substitution effect in Germany, English effect being given, the smaller will be the adverse movement of

[1] See Allen op. cit., p. 114.

[2] As a matter of fact Marshall has discussed the competition between home products and imported products, in connexion with the effects of import duties on particular industries, (*Money, Credit and Commerce*, pp. 211-17) but he is mainly concerned with the long-range (secular) effects of such duties on the substitution between the two types of goods. Our concern is with the static effects of such substitution.

German terms and less favourable will trade be to her consequent on the advent of *g* export monopoly. The converse of this proposition is equally true. If in magnitude the German effect were to exceed unity, import prices would rise more because of the relative difficulty felt by German consumers in substituting home goods for imported ones. On the contrary should the effect be less than unity, the rise in import prices will be small and more than counterbalanced by a substitution of home goods. In case the effect is just unity, the situation will be no better or no worse. This is, of course, a limiting case.

vi

In general the magnitude of the substitution effect will be great or small according as the *g* good occupies a predominant or subordinate position in the total bulk of English imports into Germany. The more important its position, the higher will be the over-all rise in German import prices and for that reason, greater will be the German effect. From the point of view of English traders as a whole, the *g* export monopoly will not be harmful provided it does not indirectly recoil on their individual markets. This proviso means that *g* should possess the 'importance of being unimportant'.

One additional point remains to be noticed in the above context. A raw material or semi-manufactured good for which the demand is derived and suitable substitutes are not available at home will make the English monopoly power effective. On the other hand a finished article, especially a luxury product, used by a small class of buyers in Germany may reduce or even frustrate the monopoly power of England, since the demand for this is elastic and moreover substitutes can be found if its import is very costly. From the point of view of English trade interests as a whole, such a sort of monopoly cannot always be

beneficial. For, though it might enable a few entrepreneurs to swell their profits, other traders will stand to suffer on the former's account because of the capacity of German consumers to cut down the demand for non-monopolized import goods and to change over to home-made goods.

vii

Let us pass on to consider the effects of monopolistic trading on the factor market. We are now concerned to analyse the distrubances of equilibrium in the factor market within English and German export industries consequent on the monopolization of *g* good. As to the *g* industry, the factor earnings will be reduced in the ratio of $MP \times MR/AR$, changes in marginal productivity being assumed away, after the advent of monopoly. There will be exploitation of factors in inverse proportion to their elasticities of supply. These are familiar theorems on the subject.[1]

It is of particular interest to observe the reaction on earnings of freely variable factors in the *g* industry. In regard to them, the *g* monopolist is not a sole buyer; he has, therefore, to pay them competitive wages, or else they will withdraw from this industry and set up an unstable equilibrium into other export industries. For such a withdrawal will augment their supply in other industries and press down their supply price. There will be a tendency to substitute them for the more expensive factors. As to how far they will benefit from the withdrawal from *g* depends upon the elasticity of substitution in respect of factors specific to other export industries. Here also we have to fall back on the results that have passed into accepted theory. We should note that the factor market will arrive at no stable equilibrium unless the freely vari-

[1] Joan Robinson, op. cit., p. 282 ff. Pigou, *Economics of Welfare*, p. 549 ff. It is assumed that all these factors can be employed only in the other export industries and there is no possibility of their being transferred to home industries.

able factors earn uniform wages in all export industries, due allowance being made for cost of movement.

As to the disturbances in the entire perfectly competitive factor market of English export industries caused by shifts in terms of trade we have only to follow the classical analysis. A rise of export prices will increase incomes of the hired factors subject to their productivity and supply elasticities, and conversely, a fall in them will diminish their incomes.

In the same way the analysis concerning shifts in the equilibrium of German factor market of all but the g export industries has to be pursued along the classical lines, subject to the reservation made necessary because of import substitution as affecting the terms of trade. In general, an increase in the demand for home goods will benefit all factors required for making them, but the relative share of factors which are specific to the industry will be greater than the non-specific ones.[1] In like manner a rise in the price of g material and others imported from England will tend to push up higher the prices of those final commodities of export from Germany which require these materials in greater quantities and find it more difficult to substitute them. When German export prices of such commodities rise, there will follow a decline in their demand from the other country and this will again affect non-specific more than specific factors in German export industries.

viii

Finally we turn to the influence of transport costs and bounties on the framework of Anglo-German trade. The commodities move only between two fixed points and as such the expenses of moving goods between them are constant. These will be calculated separately in respect of each traded commodity and added into the production cost. The prices quoted by English

[1] J. R. Hicks, 'Distribution and Economic Progress—A Revised Version', *R E S.* Vol IV (1936-37).

and German merchants will rise and this will affect their individual demand curves. The monopolists will find their demand schedule lowered and their price policies will be altered. The effects of bounties will differ with different commodities as in respect of transport costs. Thus in both respects no new issue of analytical interest presents itself as Anglo-German trade widens out into multi-commodity channels.

Model C

i

Let us step out of the bilateral world and enter a wider one composed of many countries dealing in numerous commodities. The monopoly situation has become more intricate but approaches closer to the facts of the real world. There are, let us suppose, m different countries exchanging among themselves n different commodities. All the commodities save d are traded under competitive conditions. That is to say, they can be produced and exported by a number of countries at prices equal to marginal cost of production inclusive of transport charges. The d commodity is produced by A only which can hold its export price above the marginal cost.

ii

The characteristics describing exchange equilibrium within this many-country world can best be studied by subjecting to close scrutiny a small sector comprised of any three countries—A, B, C. Conclusions relevant to this sector can be readily extended to the entire system. In the initial stage simple competition reigns in the trade markets of these countries, and commodities a to i only enter into trade. In order that trade may come into equilibrium the rival strengths of national demands for the given commodities, that is their preference ratios, must equalize with their cost

ratios in the respective countries. This is in keeping with the traditional theory of International Values. In a particular position of trade equilibrium we may find commodities *a, b, c, d* exported from *A* ; *e, f* from B and *i, j* from *C*. To this composition and direction of imports and exports from *A*, *B* and *C* will apply the Yntema identities (i) and (ii) and equations described in model B. It is thus revealed that there is no departure in point of principle as between bilateral and mutilateral trade.

From this competitive state of affairs there is now a change over to monopoly in respect of *d* export industry in *A*. The rest of the commodities in *A*, *B* and *C*. continue to be traded under competitive conditions. The course of trade will now be disturbed by the onset of *A*'s export monopoly. Now this term may be interpreted to mean simply that *A*'s export firms in the *d* industry which were hitherto individual and independent units of business are now centralized under a single selling organization. Yet to such an interpretation a decisive objection may be raised. The fact that *A* is producing and selling *d* under central syndicate or governmental agency cannot by itself confer monopoly power upon the country, though it might strengthen her bargaining capacity in the world market. So long as *A*'s scale is not large enough to cater exclusively for the whole world she will not achieve monopoly position in that commodity. We have, therefore, to assume that owing to technological inventions or discovery of fresh resources, *A* has successfully ousted all its rivals from the trading field, and become at last an export monopolist in respect of *d*. Hence *A*'s market is thus considerably extended. This means the overheads have increased and greater economies of scale are now reaped. The consequence of monopolization will thus be manifest in an upward shift and lengthening out of the cost curve. In other words, the new total cost function will have a numerically higher constant and its rate of change at the limit will

be comparatively greater than before for every finite value of output. Thus the advent of monopoly in the *d* industry carries with it basic changes in the conditions of demand and cost. The monopolist is not only faced with the entire demand curve for the commodity, but reaps on the side of cost all the advantages of extension of the market.

iii

Consider now the reaction of monopolization on individual equilibrium of the *d* industry and the general trade equilibrium. The price of the product and its output will be governed by the formulae.[1] We shall leave out of account in this section the possibility of price-discrimination in regard to *d* in the *B* and *C* import markets. The monopoly output will always be larger than the former competitive output, for the industry has now expanded. But the monopoly price will be lower, equal or higher than the former price according as $Mc_1/Mc_2 \gtrless \eta_2/\eta_2 - 1$ [2] There is the greater possibility of the price sliding down when world demand for *d* becomes more elastic and/or marginal costs fall faster. As a general rule *A*'s general monopolization of *d* exports will lower the elasticity of world demand rather than raise it, especially if it happens to be a raw material required by many countries for numerous industries. In such a case the fall in marginal costs will have to be steeper in

[1] It is urged that price-cost equilibrium of a commodity becomes unstable when monopoly supervenes competition This instability, however obtains *through time*, that is, is a secular phenomenon and is not strictly relevant to the static analysis pursued here

[2] Write Mc_1 and Mc_2 for marginal cost of equilibrium output and η_1 and η_2 for the elasticity of demand under former and present conditions respectively

$$AR_1 = Mc_1 \quad \text{and} \quad AR_2 = Mc_2 \ (\eta_2/\eta_2 - 1)$$

$$\frac{AR_1}{AR_2} = \frac{Mc_1}{Mc_2} \frac{\eta_2 - 1}{\eta_2}$$

$$\therefore \ AR_1 \gtrless AR_2 \text{ provided that } \frac{Mc_1}{Mc_2} \lesseqgtr \frac{\eta_2}{\eta_2 - 1}$$

order that price of the product might be lower than the former level.

iv

In the light of the formal analysis of last section, it is possible to answer more effectively the question usually put in this context : Which is more beneficial from the consumer's point of view, competition or monopoly ? As a monopolist of d exports A comes to acquire considerable advantages of the extension of the market which could not have arisen in a regime of perfect competition.[1] There is perfect decentralization of productive capacity in such a regime, and hence the economies of buying and selling and of large scale enterprise are denied to firms organized on a competitive basis. At the same time the firms can exercise no control on the market, and therefore the buyers are assured of fair terms. The transition from competition to monopoly carries with itself all such possibilities of control. The buyer stands in the peril of being charged higher prices by the monopolist. From this peril the buyer will be freed provided that the monopolist has substantially cut down his marginal costs by means of economies of vertical and lateral integration,[2] and further that the demand for the product has become more elastic. The greater the fall in the supply curve consequent on the extension of the export market, the smaller are the chances of the buyer being injured by monopoly power. Such a fall will generally obtain as the industry extends through time. This will no doubt mean an instability of monopoly price. Yet if the condition given above (see footnote on previous page) is satisfied, it will mean a continual cheapening of the monopolized product and hence will be beneficial to the consumer.

[1] For this reason the comparison between competitive and monopolistic output is not valid save when no change in productive technique and organization is assumed. See Joan Robinson, *Imperfect Competition*, pp 170-6

[2] See D. H Robertson, *The Control of Industry*, pp 32-6 ; also Austin Robinson, *Monopoly*, pp 110 ff

v

The export monopolist of d finds that his import market is not homogeneous : it consists of separate national markets which differ in their demand elasticity for d. Here then is a situation favourable to price-discrimination. Geographical barriers will make it difficult for importers to move goods from one country to another and smooth out price differences, provided they are below the cost of transport between the importing countries. The price charged for exports to any country will be higher, the less elastic is the import demand of that country. The general principle on which discriminatory prices will be scheduled for different markets is as follows:[1]

$$y_{Bd}\left(1+\frac{1}{\eta_{Bd}}\right) > y_{Cd}\left(1+\frac{1}{\eta_{Cd}}\right) => 0$$

In general the more distant an importing country from a monopolist country the higher will be its demand elasticity, and hence the lower will be the degree of discrimination against it as compared to a nearby (importing) country.

As shown by Mrs Robinson the aggregate of d exports under discriminatory monopoly will be smaller than under simple monopoly subject to the reservation that demand curves of individual importing countries are neither straight lines nor are they more concave than under simple monopoly.[2]

vi

Next we turn to appraise the effects of d exports on A's terms of trade with other countries.

[1] Pigou, *Economics of Stationary States*, p 238.

[2] The conclusions reached by Mrs Robinson regarding the comparison between simple and discriminatory monopoly can be summarized as below

Write $xb = \phi_B(p)$ and $xc = \phi\, c(p)$ for demand functions of country B and C for the commodity X; η_B and η_C their respective elasticities of demand for output d_B and dc supplied by A which has the export monopoly (simple type) of the commodity Let D_B and Dc be the outputs supplied by A under discriminatory monopoly.

Then if $\phi'_B < \phi'_C$ and $\eta_B < \eta_C$, $(d_B + dc) < (D_B + Dc)$ and conversely.

In the former situation when England was exchanging goods with Germany only, her terms of trade were determined by the reciprocal demand acting upon comparative cost ratios. But now trade is no longer bilateral. *A* exchanges her goods with *B*, *C* and all other countries. Her terms of trade are, therefore, not a single ratio, but as many as the other countries, that is *m*-1 ratios. Each one is determined by *A*'s reciprocal demand for the goods of *all the other* countries. Moreover the demands will in their turn be regulated by the terms on which *A* offers her goods.

A exports goods *a*, *b*, *c*, *d* to the rest of the world and imports from B, *e*, *f* and from *C*, *g*, *h*, *i* goods in common with the other countries. The change in *A*'s terms and favourableness of trade with *B* and *C* after the monopoly of *d* will be represented by expressions similar to those set down on p. 61.

vii

When *A*'s export monopoly in *d* is established, its individual price will be raised depending upon considerations already discussed in sections iii and iv. *A*'s full trade equilibrium with respect to *B* and *C* will be affected by the price-change. Whether the shift in the equilibriumis upwards or downwards, and how large it is depends upon the Marshallian elasticity of *B*'s and *C*'s willingness to extend purchases from *A* modified by *A*'s willingness to extend sales to either country ; that is to say, the elasticity of demand of *B* as against that of supply of *A*, and similarly for the elasticities of *C* and *A*.[1] The modified elasticity formula is $\frac{\eta(1+\varepsilon)}{\varepsilon+\eta}$ where η is the demand elasticity of *B* or *C* for *A*'s exports and ε is the supply elasticity of *A* to either country. This modification

[1] See Pigou, *A Study in Public Finance*, p 204, also *Economic Essays and Addresses*, p 88. Yntema, *Mathematical Reformulation*, p 54 (formula 77), T. Scitovsky, 'A Reconsideration of the Theory of Tariffs' *R.E.S* Vol X (1944).

has now to be introduced because trade is no longer triangular but mult-iangular, and hence supply elasticity is no longer a reciprocal expression of the demand elasticity as in the former two models of bilateral trade.

A's terms of trade with *B* will rise and trade become more favourable to the former, provided that $\frac{\eta_B(1-\varepsilon_A)}{\varepsilon_A-\eta_B} > 1$ and conversely if the expression were < 1. Similarly, with respect to trade between *A* and *C*.

There will come into operation in *B* and *C* the import substitution effect indicated in model B sect. v, if the monopoly price of *d* in these countries were to rise above the competitive price. Yet if the economies of large-scale industry were to be sufficiently effective to cut down the price of *d* below perfect competition, there could be no possibility of the substitution effect working adversely against *A*, and, on the contrary, *A*'s total trade with *B* and *C* will, in all probability, be expanded. The presumption is that such favourable expansion of trade will be gained as between *A*, *B*, and *C*. It should be obvious once again that if *d* commodity presumed to be selling cheaply in *B* and *C* consequent to its monopolization were an industrial raw material, the favourableness of trade would be relatively greater for all the trading countries.

As yet we have not taken into account a complicating factor entering into the *total* trade situation; *B* is trading not only with *A* but also with *C*. *A*'s monopolization of the *d* product will therefore affect the exchange equilibrium of *B* and *C*, no less than *A* and *B* or *A* and *C*. We have therefore to deal with two more variables which are implicitly related to each other. The first is *B*'s elasticity of demand for the imports from *C* and the second its elasticity of import substitution with respect to *C*. Thus there are in all

six variables on which depend *A-B-C* trade equilibrium. These will all be disturbed as a result of the *d* monopoly and their resultant influence will be seen in a change either in the volume and prices of imports and exports or possibly in their direction. The latter can only be a possibility because the monopolization of a single product from *a* to *j* need not always lead to changes in comparative costs of all the other products. There is greater chance of the direction of trade being altered when the market for *d* has expanded widely enough to render *A*'s manufacture of *a*, *b* or *c* relatively less advantageous.

viii

As before *A*'s trade with *B* and *C* will benefit from *d* monopoly provided the commodity is essential for domestic consumption and/or making export goods *e*, *f*, *g*, *h*, and *i*. So long as substitutes are not available at a price equal to or below that of *d*, it is not possible for *B* and *C* to offset the monopoly power of *A*. But such a proviso is difficult to realize in the actual world. Most of the monopolized goods can be effectively substituted within narrow price margins. It is, therefore, in the interest of *A* not to charge other countries too high a price for *d* and to forgo part of the monopoly revenue so as to prevent their taking recourse to home-made or imported substitutes.

Another consideration concerning the favourable trend of *A*'s trade with other countries subsequent to onset of *d* monopoly is the range of her imports and exports. The larger the range of her exports as compared with imports, the greater is the possibility of import substitution effect in other countries operating adversely against *A* and thereby reducing her trading favourableness. This is the basic principle underlying Mill's analysis of the size of a trading country as affecting her gains from exchange. A smaller country sends out fewer goods than what she takes from bigger

countries, and the former is, therefore, more in a position to benefit from trade than the latter.

ix

The resultant effect of price discrimination on *A*'s terms of trade with *B* and *C* depends upon the import substitution effects of the latter two. If *A* finds that the effects operate adversely to itself and hence the net consequence of charging discriminating prices for *d* to *B* and *C* is injurious to its aggregate trading interests, it may decide to enter into a trade agreement with *B* and *C*. The purpose of the agreement will be to offer *d* and other export goods *a* to *d* at certain lower prices in return for similar concessions from *B* and *C*. The agreement would probably include the Most Favoured Nation Clause whereby the concessions which *B* and *C* have granted to one another or to other countries are also applicable to *A*. Within this trading group of countries *A*, *B* and *C*, the monopoly of *d* ceases to operate, and therefore its resultant effects set forth above do not come into play. The whole *bloc* organizes its exchange not in accordance with simple competition or monopoly, but pure barter. The equilibrium of trade is rendered unstable, and at the end of stipulated time-limits fresh terms of exchange may be continually reached between *A*, *B* and *C*. The group may trade on competitive terms with the rest of the world, but it is certain on its part *A* will continue to trade in *d* on the lines indicated above.

Our analysis thus reveals that trade agreements may arise in multilateral trading from the necessity felt by one country to safeguard her trade from the adverse trends due to the substitution in other countries of home-produced goods for monopolized goods imported from her or that of imports from some other countries for those latter. Such agreements reduce multilateral trade to bilateral trade, thus throwing out of operation both competition and monopoly in their

traditional form. The total volume of trade is restricted below the competitive level and the equilibrium of trade is rendered unstable owing to the difficulties inherent in bargaining.[1]

Model D

i

The final stage of our journey brings us into a world wherein one country A is a monopolist of all its export goods a, b, c, d and all the rest $B, C \ldots M\text{-}1, m$ are perfect competitors trading in $e, f, g \ldots n\text{-}1, n$. In this model which is a variant of that set up in the last section there is no longer a dichotomy between monopolized and non-monopolized goods exported by A. The country is a monopolist of her entire export goods as was the case in section i with this difference that she sells them not in one but many markets. Here we have therefore to deal with multi-lateral instead of bilateral trading in monopolized goods.

ii

The conditions of monopoly equilibrium in a sector of A, B, C countries can be set down without any difficulty. The two equilibria, one concerning monopolized goods and the other concerning the country's total trade as a whole are now merged into one. Yntema identities (i), (ii) and his quotations (15), (16), (18), (19) will all apply to the present situation and equations 1, 2, 3 will now be extended to each one of commodities a, b, c, d exported by A.

Since the market for each commodity has extended, their outputs will expand, but the change in their prices

[1] From the point of view of countries which need cheaper imports for raising the standard of living of their people market discrimination and trade agreements are harmful in so far as they tend more often, though not always, to make import expensive and indirectly to reduce the volume of exports. Thus a scheme of colonial discrimination as a part of the policy of Imperial Preference works out against the interests of the colonies, and even against that of the mother country. P.E.P. *Report on International Trade*, pp. 174-6.

will be upward or downward according as $MC_1/MC_2 \gtrless \eta_3/\eta_2 - 2$ as shown in the last chapter.[1] The prices of some goods will increase and of others diminish, discrimination between importing countries being left out of account. The terms of trade will rise as a rule and the extent of rise can be obtained from the average increase of export prices relatively to that of import prices. As in the previous model there will be $(m-1)$ exchange ratios at which A trades with the rest of the world while in the system as a whole there will be $m(m-1)/2$. These will be disturbed ratios as a result of A's monopolization of its export trade. The new ratios will be settled by the interaction of demand elasticities and substitution elasticities of the various trading countries. This point is discussed in detail in model C and need not be laboured here.

iii

It is of particular interest to know how far the effects of total monopolization of exports are different from those of partial monopolization. When all exports are monopolized by A their prices rise simultaneously each in proportion to the demand elasticity. The terms at which A trades with B and C and other countries will shift according to the import substitution effect first of each country with A and second of these countries *inter se*. Confining ourselves to the former effect we can readily see that the degree of import substitution will be relatively smaller than in the last model because it is more difficult to substitute entire imports as compared with a single import. The difficulty will be all the greater if the imports are required for making export goods or home goods. We may put it down as a general rule that the larger the range of A's exports, the smaller is the scope for substituting

[1] *ante* p. 68. It is implicitly assumed that the export prices a, b, c, d are independent of each other and hence the monopolization of all these goods does not alter the shape of their demand curves, as is the case in Mrs Robinson's 'World of Monopolies' If this assumption is abandoned, we shall land ourselves into Mrs Robinson's world.

home goods in other countries. From this it follows that A will find its terms more favourable consequent on the monopolization of all export goods. In other words B's and C's terms will worsen as A comes to monopolize all its exports. The favourableness of A's trade will rise if it has a wide range of exports or if they are required as raw materials or semi-finished goods in many foreign countries.

In these circumstances there arises a possibility of B and C entering into trade agreement so as to safeguard themselves from the monopoly power of A.[1] All goods exported from these countries, viz. e, f, g, h, i, j, would be offered at higher prices to A than to the rest of the world. The net effect of this trade agreement on A's terms of trade will depend on A's elasticity of import demand and that of import substitution. In all normal cases it will be forced to negotiate with B and C for more favourable export prices to them. These countries in the M-dimensional world which cannot protect themselves from such combined action will suffer from A-B-C trading combination. In this situation there are again to be found elements of instability.

[1]This reasoning is based on a probability which is the inverse of that followed up by Marshall (*Money, Credit and Commerce*, pp 200-2) wherein he discusses the monopolistic export policy of new countries which possess well-developed supplies of raw materials and essential manufactures in urgent demand from the old and densely populated countries We have argued that these countries might protect themselves by combination and agreements

CHAPTER IV

DUOPOLIC AND OLIGOPOLIC TRADE: THE REGIME OF IMPERFECT COMPETITION

MODEL A

i

IN the world of monopolistic trade where we have journeyed so far commodities were neatly arranged into homogeneous types each separated from the other by marked gaps. Whichever model we built up the basic assumption remained that the commodity-gaps were rigidly fixed, unaffected by shifts in prices.[1] It is manifest that this can least be sustained by facts of real life. It needs to be removed at this stage so that a further advance can be made towards realistic analysis.

We propose to sail into a new world-regime in which all traded commodity-types are differentiated into grades and varieties. These are close but not perfect substitutes in as much as the uniqueness of each is ensured by trade-marks, distinctive patterning and like devices. The consumers of imported varieties come to have preferences of their own and it is now the concern of wholesale as also retail importers to maintain buyers' preferences for the brands in which they deal. With this object in view products are extensively advertised. Sales are pushed as far as possible through direct selling agents. On the other hand, the peculiar requirements of different types of consumers are studied by means of careful market surveys and products are processed accordingly. Costs incurred on advertising, direct selling and special processing may, therefore, be regarded as the corollary of trade under conditions of product differentiation.

[1]Commodity substitution was postulated only in regard to home-made and imported goods See pp 62-3.

In this new regime sellers of different varieties are each faced with a falling demand curve. But the price which every seller charges his consumers is influenced by the price-reactions which he expects from his rivals. Thus every demand curve is only an estimated curve based on certain hypotheses of price and sales competition within the competing field of rival grades and varieties. The rival sellers fix the prices tentatively to change them as soon as they find actual conditions have turned out differently from what they expected.

From the foregoing account it is plain that our trading world has come fully under the sway of imperfect competition, and since its trade markets are now subject to price expectations which involve the passage of time it stands on the verge of dynamics. If, however, we allow for passage through time there will follow concomitants of this, such as uncertainty, unforeseen changes in the value of money and employment and capital movements which it is the business of dynamic analysis to investigate. This, however, is the task that will needlessly complicate our inquiry regarding trade conditions in a regime of imperfect competition. Hence, we shall abstract from time by assuming that our sellers of competing varieties make price-estimates instantaneously and although these are made at definite moments of time, there is no *time process* involved in such estimates.[1]

ii

Let us now set about to explore some typical trade situations under the new regime. As before we shall start with the simplest situation and then proceed to the more complex. Now, since our traded products are differentiated, the simplest model will be one wherein two sellers deal in competing varieties between which there are various degrees of substitutability. Hence if one country is assumed to produce only a single

[1] cf., P. A. Samuelson, 'Statics, Dynamics and the Stationary State', (*A*) *R E St.* Vol XXV (1943), pp. 57-60.

brand of 'commodity', we shall have at least three countries, such that one is a buyer of varieties produced in and exported by the other two. This gives us a trade situation which may be described as an imperfect duopoly.

England and France, let us suppose, are trading with Germany. The former two countries respectively produce for exports *a, b, c . . . g,* and *a2, b2, c2, . . . g2* brands to Germany in return for *h, i, j, . . . m, n* undifferentiated or competitive goods from her. There are no selling costs in the first stage (sections iii to vi) but come into the situation only in the second stage (section vii onwards). Costs of transport, it is further assumed, do not affect prices and outputs in an essential way and will, therefore, be left out of account all through the argument.

iii

Preliminary to the analysis of the above trade situation we should first settle the question of price-output anticipations in so far as it is bound up with duopolic and oligopolic trading. When English and French sellers meet in the German import market they will frame their own policies on what they believe to be the most likely behaviour of their rivals. The nature of duopolic competition will depend on the beliefs or assumptions on which the duopolists actually act.[1] Hence, as pointed out by Wicksell, duopoly is not a single problem but a cluster of problems each resting upon the assumptions concerning rival's reactions.[2] Yet all kinds of assumptions must be based either on the output likely to be produced by the rival or else on the price likely to be charged by him in response to one's own price or output move, either the former or the latter being treated as the *independent variable*

[1] These are essentially beliefs which are adhered to and acted upon by the sellers in the course of their price output adjustments See Pigou, *Economics of Stationary States*, p. 91n

[2] Wicksell's review of Bowley's *Mathematical Groundwork of Economics* in *Ekonomisk Tidskrift*, 1925.

of market policy. Thus a duopolist may consider his rival to be operating on his output, so that the first one retorts by encroaching upon the price. In this case the first one proceeds on the basis of a price function $p = \psi (x_1 + x_2)$, x_2 being regarded by him as a parameter. Alternatively, the duopolist may consider his rival to be operating on his price, so that the first one counters the move by encroaching upon the output. Here is a case where the first one bases his policy on a demand function $x_1 + x_2 = \phi(p)$, x_2 no longer being taken as a parameter. The former type falls within the province of Cournotian analysis while the latter under that of Bertrandian analysis. The conclusions reached by either economists have long been the subject of controversy.[1] One point which has emerged from recent contributions to the subject is that the Bertrand analysis has its relevance in a homogeneous product market wherein both the duopolists are selling an identical commodity. But it breaks down when the market comes to be differentiated into separate products. Here the Cournotian line of approach alone is appropriate. Since the two sellers are now selling their own brands there is no obligation to sell them at the same price as under a perfect duopoly. Either of them will, therefore, operate on his price instead of quantity of sales in order to meet the competition of rival brand. He will set a new price assuming his rival to be selling at his old price. As soon as the latter has altered his price, the first duopolist will now respond by adjusting his own price to this rival's alteration. In this way the process of initiating price-changes and getting adjusted to them will go on bet-

[1] A compact summary of the Cournotian and Bertrandian theories will be found in Wicksell's review of Bowley Chamberlin's and Hick's review (*Economet*, Vol III, 1935) of the various theories also set out significant differences in the various solutions Kahn (*E.J.* Vol XLIX, 1939) gives an interesting variant of the Bertrand theory by combining dynamic elements such as the memory (revision of expectations on the basis of past experience) with static behaviour. Asymmetrical treatment is also the keynote of Pigou's analysis (*Economics of Stationary States*, pp. 92-6) and that of Stackelberg summarized by Triffin in *Monopolistic Competition and General Equilibrium*, pp 49-52. The treatment adopted here is mainly on the lines of Ragnar Frisch.

ween the rivals in their imperfect duopolic market tracing what may be called price-adjustment paths. These will determine whether the price-quantity equilibrium of either duopolist could be determinate and stable.

Determinateness would be ensured when the position of equilibrium as defined by each seller's demand and cost conditions is ultimately reached in the market whatever may be the successive price-moves as between the sellers.[1] The determinate equilibrium, is therefore independent of the adjustment paths, though it is one where these must necessarily converge. On the other hand stability of equilibrium would obtain when there could exist no tendency for equilibrium to move from one position to any other. From this it follows that a stable equilibrium is also one which is unique and determinate.[2] Our present concern is to unravel the conditions under which the English and the French sellers would if at all, reach by separate paths a determinate and stable equilibrium in the German market.

iv

Let us write x_{Ga_1}, x_{Ga_2} for quantities of $a1$ and $a2$ ($a1 = a1, b1, c1 \ldots g1$, and $a2 = a2, b2, c2 \ldots g2$) varieties imported from England and France at y_{GA_1} and y_{Ga_2} prices measured in German currency. Let $Yca1$ and $Yca2$ be the average cost to the English and French exporters for supplying Germany with Q_{s, Ea_1} and Q_{s, Fa_2} quantities ($x_{Ga_1} = Q_{s, Ea_1}$ and $x_{Ga_2} = Q_{s, Fa_2}$) respectively. Then we have the following

[1]cf. N. Kaldor 'A Classificatory Note on the Determinateness of Equilibrium, *R E.S.* Vol. I (1933-34).

[2]Kaldor maintains that a multiple equilibrium can be also determinate. But though determinate it cannot be stable since each position once reached tends to be unsettled again to be temporarily stabilized at the next position.

demand and total revenue functions:

$$x_{Ga1} = \phi_{Ga1}(y_{Ga1})$$
$$x_{Ga2} = \phi_{Ga2}(y_{Ga2})$$
$$x_{Ga1}\, y_{Ga1} = R_{Ga1}(y_{Ga1})$$
$$x_{Ga2}\, y_{Ga2} = R_{Ga2}(y_{Ga2})$$

and the following total cost functions:

$$Q_{s,Ea1}\, y_{C,a1} = F_{Ea1}(x_{Ga1})$$
$$Q_{s,Ea2}\, y_{C,a2} = F_{Fa2}(x_{Ga2})$$

The total costs of England and France can be simply converted into German currency by multiplying them with the net money factor Z_G^E and Z_G^F as defined in ch. iii, mod. B, sect. iii.

We shall now proceed to set out the conditions under which each seller can maximize his profit. There arise three possibilities in respect of maximizing behaviour of the duopolic sellers and accordingly there will be three sets of conditions. In the first case the seller neglects completely the influence his rival can exercise on his own market. This will give simply monopoly equilibrium as set out in the last chapter, for which the conditions are:

$$R'_{Ga1} = F'_{Ea1}\, Z_G^E$$
$$R'_{Ga2} = F'_{Fa2}\, Z_G^F$$

and

$$R''_{Ga1} > F''_{Ea1}\, Z_G^E$$
$$R''_{Ga2} > F''_{Ga2}\, Z_G^F$$

But the special problem of duopoly is one of mutual dependence whereby either seller bases his price on the conjectural variation of the price of his rival. The differential coefficient of this may be called, after Ragnar Frisch, 'the coefficient of conjectural variation'.[1] In the present instance the value of the co-

[1] Frisch, 'Monopole-Polypole' *Nationalo Konomisk Tidskrift* Vol LXXI (1933): (1933) loc. cit. Allen, *Mathematical Analysis*, p 203 These are similar to Cournot's output conjecture curves (*Researches*, pp 81-2, figs 2 and 3).

efficient will always be positive, that is to say its limits will be zero and positive infinity. Both the sellers will now take fully into account the reaction of their rivals, and neither of them will show any inertia. Their demand functions will be written as:[1]

$$x^*_{Ga1} = \phi^*_{Ga1}\left(y_{Ga1}\ y_{Ga2}\ \frac{dy_{Ga2}}{dy_{Ga1}}\right)$$

$$x^*_{Ga2} = \phi^*_{Ga2}\left(y_{Ga2},\ y_{Ga1}\ \frac{dy_{Ga1}}{dy_{Ga2}}\right)$$

From these we shall have two conjectural total revenue functions R^*_{Ga1} and R^*_{Ga2}. The cost functions will remain unaffected by this change because there is no conjectural element in costing of either seller. Either duopolist will be in individual equilibrium provided the following maximizing conditions are fulfilled :

$$R'^*_{Ga1} = F'_{Ea1}\ Z\frac{E}{G}$$

$$R'^*_{Ga2} = F'_{Fa2}\ Z\frac{F}{G}$$

and

$$R''^*_{Ga1} > F''_{Ea1}\ Z\frac{E}{G}$$

$$R''^*_{Ga2} > F''_{Fa2}\ Z\frac{F}{G}$$

Lastly, there exists the possibility of one seller acting as the price-leader and the other as price-follower. For instance let the English seller be the leader and the French one the follower. In this case the Frisch coefficient of the former will be zero and hence his equilibrium requires conditions (i) and (ii), while the latter will have a positive coefficient and so the equilibrium is postulated by conditions (iii) and (iv).

V

Consider now the process whereby the English and French sellers will reach a determinate and stable

[1] In expanded form the equations in respect of English variety will read as below

$$x_{Ga1} + (y_{Ga1} - F'_{Ea1}\ Z\frac{E}{G})\left(\frac{\partial x_{Ga1}}{\partial y_{Ga1}} + \frac{\partial x_{Ga1}}{\partial y_{Ga1}}\frac{dy_{Ga2}}{dy_{Ga1}}\right)$$

equilibrium when they act not as two isolated monopolists but as duopolists who know that their segmented import markets in Germany are interdependent. Our interest is now centred on the competitive price policies of the sellers and their mutual adjustments. We shall work out the problem on the assumption that our sellers make estimates on the basis of U-shaped (parabolic) cost curves which remain fixed throughout the adjustment process.

Let the English and French sellers of a_1 and a_2 start from zero price-points which may be written as oPa_1 and oPa_2. Either of them will frame an initial estimated revenue curve whose slope will depend upon what the respective seller considers to be the elasticity of demand of his own and his rival product. The curve is drawn in the belief that the rival price which is given will change by a definite amount measured by the coefficient of conjectural variation when the seller has changed his own price.

Guided by their initial estimates, the sellers will proceed independently yet simultaneously to set $_1Pa_1$ and $_1Pa_2$ prices for their products. When they have already taken this step each will discover however that the actual move of the rival is at variance with the conjecture made beforehand, and hence a price readjustment is called for. Our sellers will thus be induced to take a second step and more will follow subsequently. These are the directions in which they may follow up their quest, and accordingly the three price adjustment paths which they can forge. (a) If one seller raises his price, his rival will immediately follow suit. This will lead them both on upward sloping paths.[1] (b) If he were to lower his price, even then his rival does likewise. Their paths will both be downward sloping. (c) Whether he raises or

[1] This type of price-movement as well as the (b) type is in keeping with the Edgeworthian contract and re-contract, for it is continuously upwards or, as in the (b) type, continuously downwards in the direction of the final position of equilibrium. There is no 'bluff' in either (a) or (b) type. See Chamberlin, *Monopolistic Competition*, pp 39n and 40n

lowers his price, the rival retorts by taking the opposite course.[1] In this case the sellers will travel on zig-zag paths one sloping upwards and the other downwards. We shall first analyze the (a) path turning to (b) and (c) in the sequel.

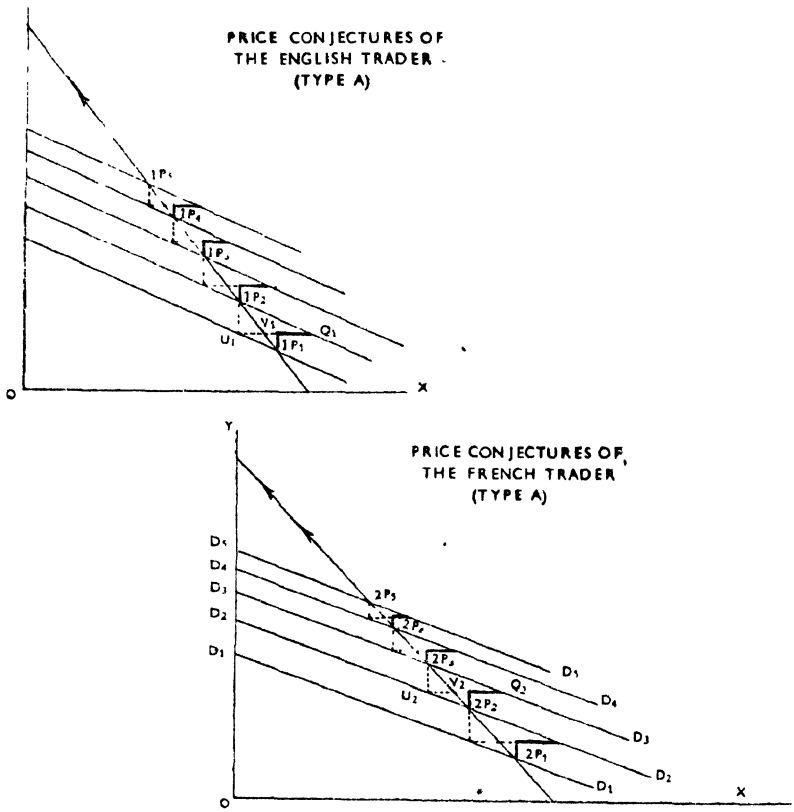


FIGURE 8 (i) and (ii)

IN EACH OF THE ABOVE FIGURES U_1, V_1 IS THE NET INCREASE IN THE SALES WHEN PRICE IS RAISED FROM P_1 TO P_2 AND U_2 V_2 THE NET INCREASE WHEN IT IS RAISED FURTHER FROM P_2 TO P_3 AND SO ON

[1] In this type the price-movement of the sellers is around the final position of equilibrium and not in a continuously upward or downward direction as in (a) and (b) types. There is a process of contract and recontract. In fact the sellers set prices to outmanoeuvre the rival by 'bluff' with a view to arriving at a secure equilibrium position.

As the English and French sellers move up from *1Pa1* and *1Pa2* to *2Pa1* and *2Pa2*, each will find his initial revenue estimate no longer holds good and needs to be revised. The English seller had drawn his initial curve assuming the Frenchman's price to be given. But meanwhile the latter has marked up his price. The English seller now comes to believe that due to the price-rise the Frenchman's customers are turned away and others reduce their purchases. Expecting some or all of the rival's clientele to come over to him, the English seller now draws up a new estimated revenue curve, the second in his series, which will stand higher above the first because it is based on the belief in an expanded market for his product. The same sort of expectation will persuade the French seller to shift up his second estimate curve above the first one. It is on these re-drawn estimated revenue curves that there could be traced the *2Pa1* and *2Pa2* price-movements of the rival duopolists.

The price-re-adjustments will continue step by step giving two series *1Pa1*, *2Pa1*, *3Pa1* . . . *nPa1* and *1Pa2*, *2Pa2*, *3Pa2* . . . *nPa2*. These are illustrated in Fig. 8 where the successive adjustments of the Englishman and the Frenchman are separately set out in (i) and (ii) and the adjustment paths in section (iii). The last one is drawn in a three dimensional surface for expositional convenience. Every upward move of either seller would necessitate a revision of his revenue estimates. But as he proceeds upwards he would find a smaller scope for a profitable increase in price and a lesser expectation of capturing the rivals market. This follows from the tendency of demand to become less and less elastic as price rises which both sellers will expect to operate in their rival markets. The successive price-rises will, therefore, be smaller and the estimated revenue curves will be ranged closer to one another as they are re-drawn at every step. The locus of adjusted price-points of each seller as he goes

on raising his price gives us his price-adjustment path (Fig. 8, iii), which will be smooth provided the adjustments are continuous and infinitely divisible. The limits of adjustments are rigidly defined by each seller's average cost for zero and optimum outputs.

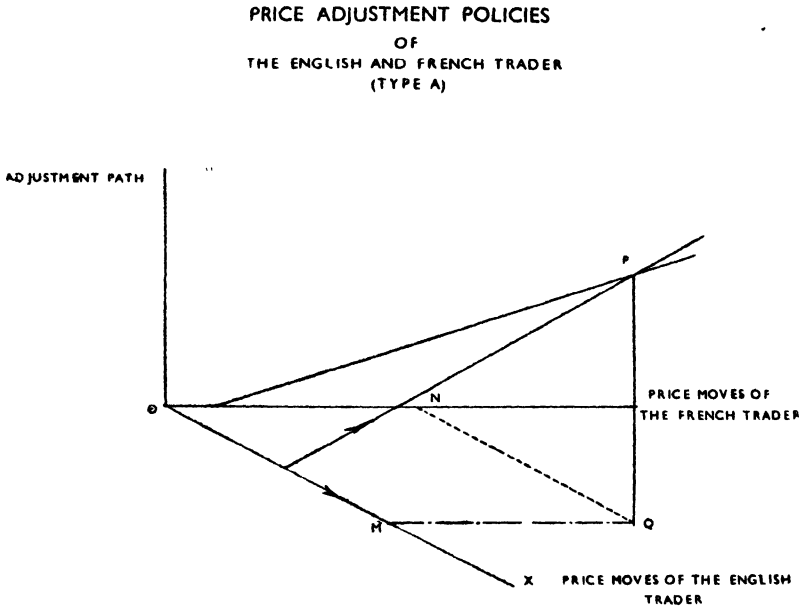


FIGURE 8 (iii)

THE PRICE MOVES OF BOTH TRADERS ARE POSITIVE, THAT IS IN THE DIRECTION AWAY FROM THE ORIGIN (AS SHOWN BY THE ARROWS) ADJUSTMENTS ARE EQUILIBRIATED WHEN THE PATHS CONVERGE AT A HEIGHT OF PQ, SO THAT THE ENGLISH TRADER FIXES A (STABLE) PRICE OF OM AND THE FRENCH TRADER ON

No seller can sell his product at a price either above or below these limits under normal business conditions wherein price must be equalized to average cost and which do not make it profitable for a seller to produce more than the optimum output.

The price adjustment paths of rival sellers will cross one another if their slopes are unequal.[1] An economic price situation can obtain only when the paths converge in the positive quadrant, in other words, the prices are positive. Further, the situation will be stable provided that at the point of intersection of the rival paths, the ratio of adjusted prices of the rivals is equal to their estimated marginal revenue and marginal costs. If we write nPa_1 ($\equiv ny_{Ga_1}$) and nPa_2 ($\equiv ny_{Ga_2}$) for the adjusted English and French sale prices at the point where their conjecture curves intersect ; $Q^*_{s,\,Ea_1}$ and $Q^*_{s,\,Fa_2}$ for the quantities estimated by them ; $R^*_{Ga_1}$ and $R^*_{Ga_2}$ as the estimated marginal revenues ; finally $F'_{Ea_1}(Q^*_{s,\,Ea_1})\,Z\frac{E}{G}$ and $F'_{Fa_2}(Q^*_{s,\,Ea_2})\,Z\frac{F}{G}$ as the marginal costs (in German currency) for the estimated quantity of exports to Germany, then stability of equilibrium requires:

$$\frac{ny_{Ga_1}}{ny_{Ga_2}} = \frac{R'^*_{Ga_1}}{R'^*_{Ga_2}} = \frac{F'_{Ea_1}(Q_{s,\,Ea_1})\,Z\frac{E}{G}}{F'_{Fa_2}(Q_{s,\,Fa_2})\,Z\frac{F}{G}}$$

As can be readily seen this condition implies that the conjectures and adjustments of the rivals should lead them nearer to one another by reducing the gap between their prices and the cost differentials.[2] This is the same thing as 'the correctness of conjectures', if we understand the term 'correctness' to mean the coincidence of natural price estimates of the duopolists with objective cost-ratios in their firms. Indeterminateness of equilibrium arises due to the failure of

[1]It is not necessary that these adjustment paths must be convex to the origin as in the case of Frisch curves of output conjecture (See Allen, *Mathematical Analysis*, pp 202-3 and Hicks, 'The Theory of Monopoly' *Economet*, Vol. III, 1935). The Frisch curves are relevant to perfect duopoly while we are concerned with imperfect duopoly. In the former there is no scope for differential prices for some outputs while there is such scope under the latter.

[2]It is not essential to the analysis of equilibrium process that price-conjectures should proceed step by step as we have described above. There can be a single movement from oPa_1 to nPa_1, and from oPa_2 to nPa_2. See J. A. Schumpeter, 'Instability of Capitalism' *E. J.* Vol. XXXVIII (1928), p. 370n. Also *Business Cycles*, Vol. I, pp. 59-62. It is convenient to assume that price adjustments proceed step by step which are small enough so as to have approximate static analysis to dynamic conditions of the real world.

such coincidence to obtain in real life.[1] We shall examine the possibilities of such failure in the next section.

Let us now turn to the (b) path which leads the English and French seller downward to competitive price-cutting. The former seller starts from *oPa1* and puts up *1Pa1* as his initial price on the basis of his revenue estimates. Meanwhile his rival has set *1Pa2* as his price. Now both of them find their estimates to have gone wrong and hence their prices need re-adjustment. Each lowers his price from *1Pa1* and *1Pa2* in the hope of getting a larger revenue and stable foothold in the market. Appropriate to this movement there will be a revision of revenue estimates by either duopolist. The English seller had assumed his rival's price to be given while drawing up his initial curve, but he is now dismayed to find that the French rival has cut his price and expanded his sales. The Englishman will anticipate that some of his own customers will be lured away by the French seller, and hence when the former re-draws his second estimate curve it will stand below the first, based as it is on the belief in a contracted market for his product. On the strength of the same expectation and the same process of adjustment the French seller will draw up his second estimate curve below the first one.

At each successive step of re-adjustment there will be a similar revision of demand estimates and re-drawing of revenue curves. These will be ranged one below the other, but farther apart as the steps proceed forward on the downward price-adjustment path. This follows from the diminishing elasticity of demand which, as shown above, both sellers will believe to hold good for their products. The loci points at which the English and the French sellers adjust their policies at different steps give us their downward sloping adjustment paths. The successive price-adjust-

[1] There is in real life a large element of uncertainty due to mood and bluff. See Pigou, loc. cit.; Chamberlin, *Monopolistic Competition*, p. 46.

ments of either seller and the rival adjustment paths are illustrated in Fig. 9, sections (i), (ii) and (iii) in the

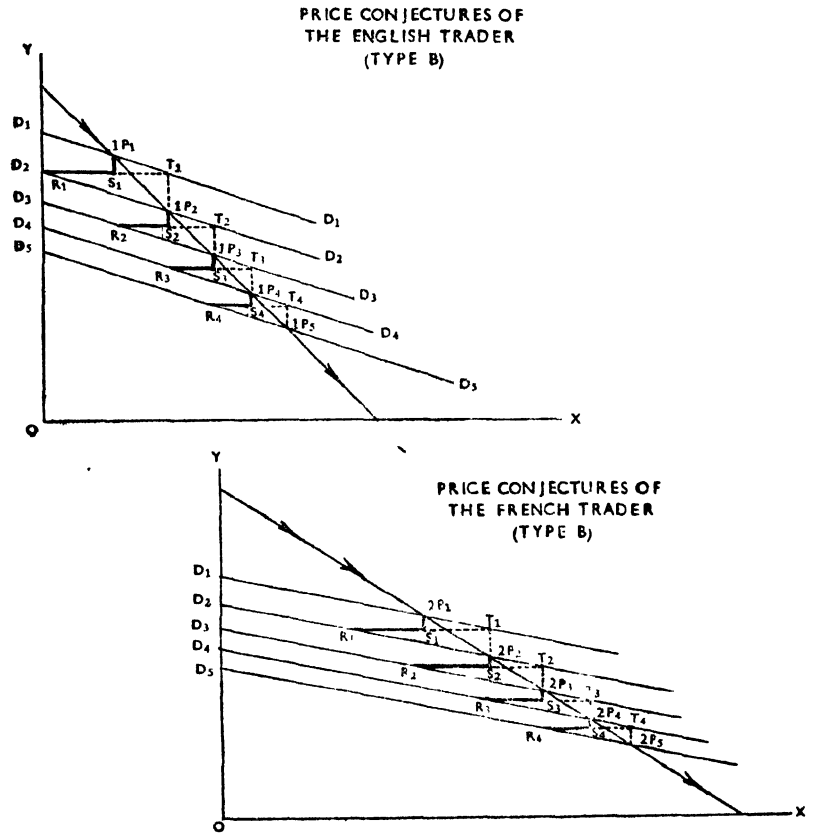


FIGURE 9 (I) and (II)

IN EACH OF THE ABOVE FIGURES $R_1 S_1$ IS THE NET ANTICIPATED INCREASE IN THE SALES WHEN PRICE IS LOWERED FROM P_1 TO P_2 AND $R_2 S_2$ THE NET INCREASE WHEN IT IS LOWERED STILL FURTHER FROM P_2 TO P_3 AND SO ON

same way as in the former figure. As before the upper and lower limits of each path are set by the maximum and minimum points on the average cost curve of

each seller as it slopes down from left to right.[1] If the paths are convergent, their point of intersection indicates stable equilibrium to which the stability condition given above is fully applicable.

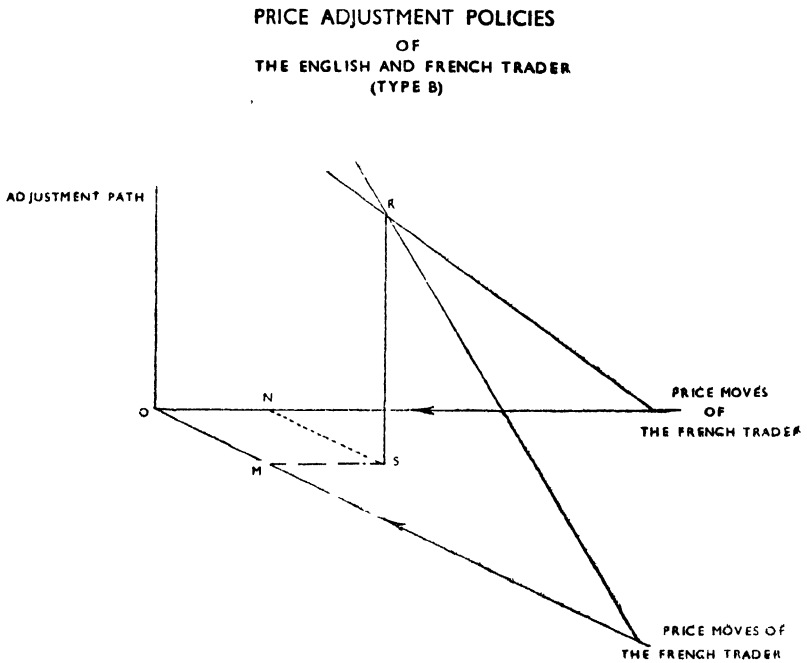


FIGURE 9 (iii)

THE PRICE MOVES OF EITHER TRADER ARE NOW NEGATIVES, THAT IS IN THE DIRECTION TOWARDS THE ORIGIN (AS SHOWN BY THE ARROWS). ADJUSTMENTS ARRIVE INTO EQUILIBRIUM AT A HEIGHT OF RS SO THAT THE ENGLISH TRADER CHARGES A (STABLE) PRICE OF OM, AND THE FRENCH TRADER ON

There remains to be explored path (c) which charts out the adjustment process between sellers moving in

[1]The possibility of cutting prices below minimum average cost is ruled out as it would involve the sellers in losses. In real situations prices are cut below average even below marginal costs because of expectations of losses being recouped in the future when prices rise. The process was first set forth by Edgeworth (*Papers* Vol I, pp 118-21). Another version is given by Chamberlin op cit, pp 32ff

opposite directions. Suppose the English seller has raised his price from $_1Pa_1$ to $_2Pa_1$. This will induce the rival to cut his price instantaneously from $_1Pa_2$ to $_2Pa_2$ in the hope of driving down the Englishman's market and thereby reaping his profits. The English seller will now protect himself by cutting his own price from $_2Pa_1$ to $_3Pa_1$ in retort to the Frenchman. Meanwhile the latter will put up a higher price $_4Pa_2$ and the English rival will be taking the opposite step, $_4Pa_1$. While this see-saw movement goes on as the sellers take successive steps,[1] their revenue estimates will also be revised. The estimate curves of each seller will however be ranged upwards and downwards alternately as he decides on raising and subsequently lowering his price. Fig. 10, sections (i), (ii) and (iii) illustrate the individual adjustments of the duopolists and their adjustment paths.

Since the successive steps of the rival seller are in opposite directions, it follows that as they forge ahead one will be moving upwards and the other downwards. The paths will not be smooth, but 'dented' and the dents will be smaller as the paths stretch forward, provided, however, they converge towards one another. In other words, the amplitude of price-variation will be smaller and smaller as the sellers come nearer in their price-adjustment process. The stability conditions will be the same as before. As a corollary to this it should be added that once the duopolists reach determinate price-policies in the manner shown above they do not slide back on the zig-zag path by which they have arrived into the determinate position. Thus there is no further revision of adjustments beyond the stage where these are equilibrated. No doubt this corollary applies to the previous two—(a) and (b) cases as much as this one. Only it is more relevant to the present case, because when sellers are resorting alter-

[1]The process is described in full detail by Edgeworth, *Papers* Vol. I, pp 118-21. For a critical discussion see Chamberlin loc. cit., ch. iii, sect. iii. Also A. Smithies, 'Equilibrium in Monopolistic Competition' *Q. J. E.* Vol LV (1941).

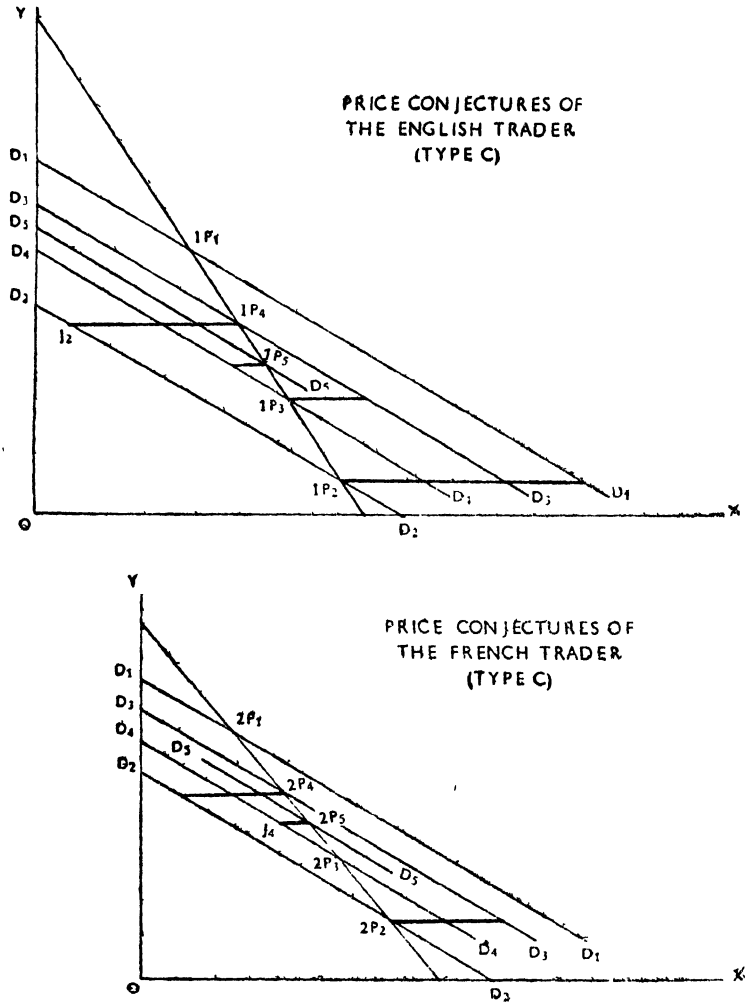


FIGURE 10 (I) and (II)

IN EACH OF THE ABOVE FIGURES J_1K_1 IS THE ANTICIPATED INCREASE IN SALES WHEN PRICE IS LOWERED FROM P_1 TO P_2 AND J_2K_2 THE INCREASE IN SALES WHEN THE PRICE IS ALTERNATELY RAISED FROM P_2 TO P_3 AND SO ON

nately to price-rises and price-cuts they may continue to do this, even after the equilibrium position has been reached, with a view to wearing down or frustrating

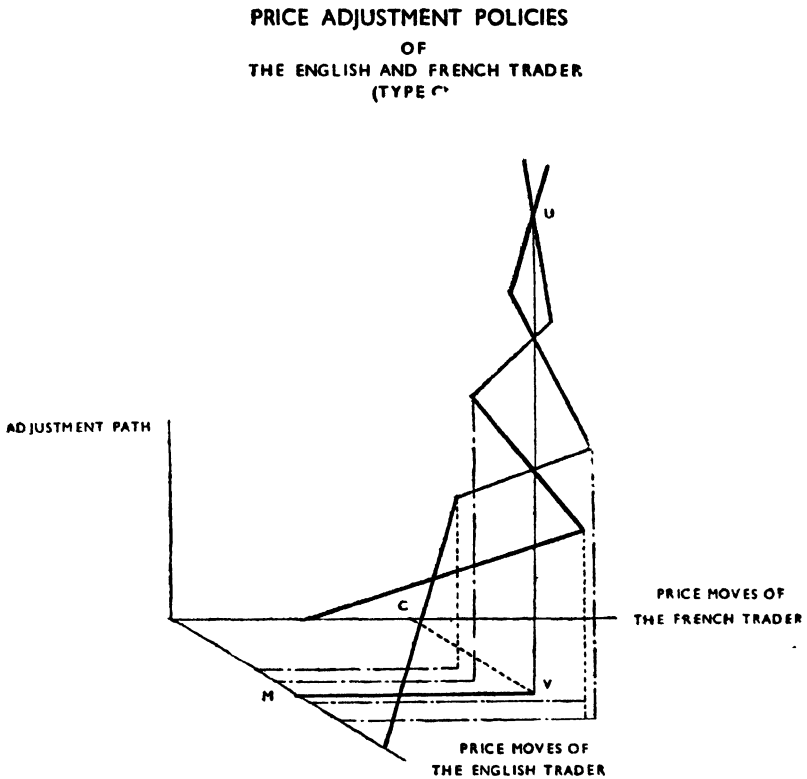


FIGURE 10 (III)

THE PRICE MOVES OF EITHER SELLER ARE POSITIVE AND NEGATIVE LTERNATELY. SO THE MOVEMENT TOWARDS THE EQUILIBRIUM IS NOT ONTINUOUS BUT OSCILLATING ADJUSTMENTS ARE EQUILIBRATED AT U AT HEIGHT OF UV, SO THAT THE STABLE PRICE OF THE ENGLISH TRADER IS IM AND THAT OF THE FRENCH TRADER ON

the rival and ultimately driving him out of the market altogether. This possibility is ruled out from our analysis, bounded as it is within statical assumptions.

vi

Take up next the problem of stability of duopolic equilibrium. We saw in the above section that stability implies correctness of conjectures on the part of rival sellers. The question that arises is : How far can duopolic conjectures turn out to be correct in the world of foreign trade ? Our sellers come from two different countries—England and France. There is no factor mobility between them so that their cost functions are bound to be different. The exporters, however, meet in the German market and it is there that they frame their respective price policies. Now if their conjectural prices move in consonance with their marginal costs so that a raising and cutting of prices by the rivals is accompanied by an instantaneous adjustment in their marginal costs, what Schumpeter calls *tatonnement*,[1] their price policies in the German market are bound to reach a determinate position and there cannot exist a range of determinateness as has been shown by Edgeworth. This arises in the real world because of two factors : in the first place there are 'such things as bluffing, the use of non-economic force will force the other economic party to their knees'[2] which frustrates the operation of equilibriating process ; and secondly there are the reservation prices quoted by duopolists which imply shifting cost curves as in respect of either seller as price-bidding proceeds. The first factor brings a non-economic element and the second a dynamic element into the market situation and as such the analysis we have so far pursued cannot accommodate them. Provided that we postulate either seller to act as monopolist (a) without employing any coercion, (b) knowing full well that he has to reckon with the reactions of his rival, (c) possessing no power to hold back stocks but obliged to dispose of them readily in the market and finally (d) operating

[1]'Instability of Capitalism' *E. J.* Vol XXXVIII (1928), p 370n.

[2]Schumpeter, loc cit , p 371.

with falling costs, the market equilibrium will be determinate and stable.[1]

Within the framework of assumptions laid down above asymmetry of price-conjectures as between rival sellers (price-leader case) is not a necessary condition of stability as has been maintained by Pigou and Kahn.[2] It is only when we cross over into the province of dynamic duopoly—duopoly over time—that asymmetry becomes a necessary condition for a determinate and stable solution.

vii

We now proceed to introduce selling costs into our analysis. It was pointed out in ch. ii, sect. i that these involve changes in demand conditions which cannot be foreseen. The extent to which sale expenditure can succeed in raising the seller's demand curve is by no means determinate. Moreover the selling costs incurred by a seller may raise not only his own demand curve but also of his rival. The usual object of incurring sales costs is to expand sales at market prices which are ruling in the market as the result of competition between sellers and which the buyers regard as fixed by convention and custom. Under such conditions advertising becomes a means to raise the demand curve not vertically but horizontally. It is aided by another weapon, viz. direct selling by means of which the export seller seeks to penetrate into those market zones where the product is not known or is not in considerable demand. It will therefore be convenient to treat both advertising and direct selling together as embodying selling policies of the exporters.

Under the selling costs regime we shall have the following demand functions

$$x_{Ga1} = S_{Ga1}\ (y_{Ga1},\ S_{Ga1},\ y_{Ga2})$$
$$x_{Ga2} = S_{Ga2}\ (y_{Ga2},\ S_{Ga2},\ y_{Ga1})$$

[1] Schumpeter, loc. cit., sect iii

[2] Pigou, op. cit., p 92, R F. Kahn, 'The Problem of Duopoly' *E J.* Vol XLVII (1937)

The expected total revenue functions of the English and French exporters (sellers of *a1* and *a2*) will be as below when each regards his rival's price to be given

$$x_{Ga1}\, y_{Ga1} = R^*_{Ga1}(y_{Ga1},\ S_{Ga1})$$
$$x_{Ga2}\, y_{Ga2} = R^*_{Ga2}(y_{Ga2},\ S_{Ga2})$$

The total cost functions of either exporter will remain unchanged by the advent of selling cost regime. The maximizing conditions will be

$$\frac{\partial (x^*_{Ga1}\, y_{Ga1})}{\partial x^*_{Ga1}}\, dx^*_{Ga1} + \frac{\partial (x^*_{Ga1}\, y_{Ga1})}{\partial S_{Ga1}}\, dS_{Ga1} = \frac{\partial F_{Ga1}}{\partial x^*_{Ga1}} + \frac{\partial S_{Ga1}}{\partial x^*_{Ga1}}$$

and

$$\frac{\partial (x^*_{Ga2}\, y_{Ga2})}{\partial x^*_{Ga2}}\, dx^*_{Ga2} + \frac{\partial (x^*_{Ga2}\, y_{Ga2})}{\partial S_{Ga2}}\, d S_{Ga2} = \frac{\partial F_{Ga2}}{\partial x^*_{Ga2}} + \frac{\partial S_{Ga2}}{\partial x^*_{Ga2}}$$

Since the above revenue function is now of two variables, we may neglect the second order of condition of maximization.

The estimated demand and total revenue functions of both the English and French exporters will be the same as before, for either seller will regulate his output by conjecturing the price charged by his rival, but the rival's selling expenditure will not affect his price conjecture. Hence the entire analysis of price adjustment process as worked out in section v applies to Anglo-French duopoly after the advent of selling cost. There is, however, an important modification in the conditions governing the stability of the process. Formerly stable equilibrium required equality of estimated price ratios as between the rivals with their estimated marginal revenue ratios and the actual marginal cost ratios. Now a new variable quantity, viz. selling costs has been introduced. Hence the two former ratios as between estimated prices and marginal

revenues have now to be equated with marginal production cost plus marginal selling cost ratios. The stability condition is, therefore,

$$\frac{ny_{Ga1}}{ny_{Ga2}} = \frac{R'^{*}_{Ga1}}{R'^{*}_{Ga2}}$$

$$= \frac{F'_{Ea1}\,(Q^{*}_{s,Ea1})\,Z^{\frac{E}{G}}}{F'_{Fa2}\,(Q^{*}_{s,Fa2})\,Z^{\frac{F}{G}}} = \frac{\partial S_{Ga1}}{\partial x^{*}_{Ga1}} \Big/ \frac{\partial S_{Ga2}}{\partial x^{*}_{Ga2}}$$

which means that the increment in total production costs added to that in selling costs of the duopolic sellers must together be equal to the increments in their respective total revenues. Now this condition makes stability more difficult to attain than in the previous situation. For it is now less probable for the rivals to hit upon a conjectural output in respect of which their rates of marginal production costs plus selling costs should be proportionately equal to the rates of total revenue. The sellers may however be selling outputs at prices which are proportionate to their marginal production costs, but out of proportion with selling outlays. In that case they will tend to reduce these outlays so as to sell smaller or larger outputs. When the duopolists are indeterminate in this way, the market equilibrium becomes unstable. In order to provide for stability we should have to assume that the selling costs of either seller rise in the same ratio as their production cost ; in other words, their advertising and direct selling are rigidly competitive. But if this were to hold, the sellers would not be induced to have recourse to these methods, or if they ever did, they would readily abandon them. We are therefore led to the conclusion that, save under the rigorous condition we have laid down above, duopolic equilibrium between Anglo-French traders will be rendered unstable when they resort to advertising and direct selling methods.

viii

We have now reached a vantage-point from which come into full view the trade relationships as a whole

between England, France and Germany. The foregoing analysis of Anglo-French duopoly has yielded conclusions which apply to Germany's import trade with these two countries. But the export trade of Germany is on a competitive basis and its equilibrium conditions are given by the Yntema equation. Now England and France also exchange goods as between themselves and since they trade as two independent monopolists in respect of their imports[1] each trying to maximize its revenue by selling her goods in the other country, their trade will be subject to condition of monopoly equilibrium as laid down by the familiar equations.

The Yntema identities (i), (ii) and equations **15, 16, 18** will apply to the total trade equilibrium as between the three countries. There will be three ratios of exchange between the three countries all interdependent of one another. Each country's trade equilibrium will be described by its terms of trade, that is to say its level of import and export prices. The rates of exchange and terms of trade of the three countries will be stable provided that Anglo-French duopolic equilibrium in the German market is stable. For instability can arise only from duopolic trading, while competitive trading by Germany as well as monopolistic trading between England and France must necessarily be stable.

Germany will send out goods to the other two countries at prices which are equal to marginal costs, but she will import goods from them at prices which are above marginal costs. Assuming that there are no economies of large-scale industries after the advent of product differentiation in England and France we should expect the exports from these countries to sell in the German market at prices higher than the competitive level. That is to say, German consumers would pay more for their imports than in the competi-

[1] It is assumed that the commodities meant for exports are not released for home consumption and hence there is no competition within *A* or *B* market as between a_1 and a_2, b_1 and b_2 etc.

tive regime. Their purchasing power would thus be depleted below the former level. Its effect will be seen in the shifts in the Anglo-German and Franco-German terms of trade, these shifts measuring the degree of uncompensated change as defined on p. 58. The direction and magnitude of shifts will be governed by Marshallian elasticity of import demand and the import substitution effect already discussed in ch. iii, mod. B sect. v.

England and France will between themselves exchange differentiated goods, either country selling them to the other one under the rule of monopoly. But if the export varieties a_1, a_2 of either country are sold at home also, then these would give rise to duopolic competition and the prices would be determined by the same principles applicable to Anglo-French duopoly in the German market. Should the trade between England and France be conducted under the simple conditions of monopoly the English and French import and export prices will rise above the perfectly competitive level on the proviso that monopoly power in either country is not equal. The relative rise in prices will, of course, depend upon the Marshallian elasticity and the import substitution effect. If the monopoly power of either country were more or less equal, the relative rise in prices, that is the terms of trade, would not shift above the competitive level.

Let us now consider the volume of trading between all the three countries under this regime. Since the prices of imports and exports of differentiated goods have risen above the competitive level the total volume of trade will fall below what it used to be in the former regime. Those products which are more inelastic in demand, for instance, raw materials and semi-manufactured goods, will be exported in smaller quantities and their prices will tend to rise in greater proportion. On the whole duopolic competition will be keener, the greater the demand elasticity of products, because it would then be more difficult for either seller to cut

into the market of his rival. Hence English and French varieties which are more elastic in demand will suffer less reduction in volume as compared with those which have a comparatively inelastic demand.

The English and French sellers may resort to advertising and direct selling in respect of those varieties which are highly elastic and whose prices cannot be varied without considerably losing the market. Here the price rigidities will be combated by means of selling campaigns designed to expand the sales. But as we have seen the effects of such campaigns on the volume of sales are not determinate. If these campaigns are launched by both the duopolists and if consumers in foreign countries are suggestible, both of them may succeed in increasing the quantity of sales up to a limit (selling cost optimum) but they will soon find that this competitive salesmanship does not pay and they would be discouraged from intesifying it. We may thus conclude that the introduction of selling costs by English and French sellers will as a rule increase the volume of exports, especially of products which are in highly elastic demand. The scope for such expansion is, however, limited if both the duopolists start on competitive advertising and direct selling.

ix

Let us now enter the factor market within the duopolist countries and study the situation with and without selling costs.

Since both English and French traders act as non-perfect competitors in their trade with Germany, the factor markets in the duopolized goods are subject to exploitation. The factor market equilibrium has now come within the scope of findings reached in mod. B sect. vii of the last chapter. Our present task is to look closely into the content of the findings and to indicate how the new elements introduced into the trade situation, viz. product differentiation, affects the earnings of factors.

The principal element entering into the fortunes of factors in the English and French export industries is the conjectures of sellers in either countries. The volume of employment will shift according to changes in price- and cost-adjustments. The specific factors will suffer more than the non-specific ones. The extent of exploitation will be governed by the same rule as under simple monopoly: $MP \times MR/AR$, but AR, that is price, and MR, the marginal revenue, are now subject to conjectures of duopolic traders which cause the commodity equilibrium to be indeterminate and unstable. This new element will, on the whole, make the lot of hired factors worse than under single monopoly where stability of employment was safeguarded by the determinateness and stability of commodity equilibrium.

Direct exporting and advertising initiated by English and French traders will, however, add to the employment of factors. As a matter of fact, it will create a demand for new factors which had no place in the former structure of industry. A peculiarity of this new class is that their employment will rise or fall according as they prove or fail to prove their skill in raising the import demand curve of the differentiated product in foreign countries. Besides direct export agencies and advertising bureaux there will come into existence another factor class, designers and technicians, who adapt the processing of the product to the special needs of German consumers. They will keep on changing the processing so as to attract new customers and to retain old ones. Product diversification is an important weapon in duopolic as well as oligopolic trade, and hence the sellers in a regime of imperfect competition will employ designers, technicians and market surveyors to explore the tastes of consumers, to scrutinize the quality and make of rival products and to adapt or change from time to time the design and get-up of their own product to meet the competition from rivals.

x

At the final stage let us take stock of transport costs, bounties and taxes mainly to see how the foregoing analysis is affected by them. So far as transport is concerned it should be plain that the duopolists can use this as a weapon of price-discrimination. Thus goods sold by English merchants in Germany and France may be charged different prices so long as the difference is not greater than the cost of transport, and the same policy may be adopted by French merchants. This kind of discrimination will tend to increase rather than reduce the price-differentials between English and French variety-products and further it will widen the range of price-conjectures, that is, the cross-price coefficients between these products. Bounties on the production of duopolic firms will help to reduce their costs and undersell the rivals from other countries with a view to driving them out of the field. Such countries may thus help the duopolists to acquire a monopoly of the home or the foreign market. Similar effect can also be produced by the imposition of *ad valorem* duties on the import of differentiated product. In reality taxes and bounties have sometimes been used by the State either to establish export monopolies or to fight out foreign competition in the home market and thus help in establishing home-monopolies. Nevertheless the same weapons can be employed for the direct encouragement of free competition in the home or the foreign market. Thus bounties may be granted for starting rival firms or industries and taxes imposed on monopolists and duopolists for the control of price and output.

Model B

i

The landscape gains in range and also in depth as we pass on from duopolic to oligopolic trade. Here are available numerous kinds of 'commodity-types' no longer in two but many varieties produced in different

countries. Each variety is a close but not a perfect substitute of the other. There exist price-differentials between one variety and another and the prices charged by their sellers are influenced by their estimates or conjectures as regards the reaction of their rivals. All these features characterized the previous situation; only they have become more complex in the present one since the number of competing exporters from different countries have increased. Duopolic and oligopolic trade under a regime of product differentiation are quantitatively alike in that both postulate exporters who are conscious of their rivals' reactions but are free to sell at different prices.[1]

We shall first set out clearly the assumptions under which the trade problems in this oligopolic regime are to be investigated.

(i) There are M countries trading in N commodities. All countries save the Mth one produce and export only differentiated products, while the Mth country makes only homogeneous or perfectively competitive goods. By so marking off the Mth from the rest of the countries, trading in differentiated products will be thrown into sharp relief against competitive trading.

(ii) The number of varieties entering into trade and their directions are fixed in the first stage of the argument (section i to iv). This assumption will be subsequently dropped when its purpose is served.

Thus $A,B,C \ldots L$ countries manufacture for export a to j types of differentiated commodities in exchange for k, l, m, n homogeneous commodities from the Mth country. Each of a to j types is available in three varieties made in different countries. For instance A, B, and C export a_1, b_1, c_1; a_2, b_2, c_2; and a_3, b_3, c_3 respectively; similarly for D, E, F and G, H, I etc.

[1]For a rigorous treatment of duopolic and oligopolic market equilibrium see A Smithies, 'Equilibrium in Monopolistic Competition' *Q. J. E.* Vol. LV (1941) and 'Stability of Equilibrium' *Economet.* Vol. II (1941).

(iii) Rival sellers dealing in competing varieties act on the belief that they can encroach upon each other's market segments. Due to this reason, for their own prices they estimate or conjecture the reactions of all their rivals, it being assumed that no rival shows any inertia in price-adjustments.

There are no selling costs in the first stage (section i to iii) these being introduced subsequently.

(iv) Transport costs, tariffs and such other hindrances operate on the trade situation in like manner indicated in mod. A. sect. x.

ii

In keeping with the method following in the last chapter in models C and D we shall isolate for detailed investigation a smaller sector of trading system composed of A, B, C and M countries. Conclusions emerging from this investigation can be readily extended to the total trade system.

By assumption (ii) A, B, C will trade with M in a_1, a_2, a_3 ; b_1, b_2, b_3 ; c_1, c_2, c_3 in return for k, l, m, n from the latter. It can be immediately seen that prices of the latter goods will be uniform (with due allowance for transport costs) in A, B, C depending uniquely on the volume of aggregate demand from these three countries. But the price of differentiated goods from the three countries will differ within the same country owing to the segmentation of the market. Moreover these prices will be subject to conjectural influences. Since the competing sellers are now more than two the scope of conjectural behaviour is widened. Our first concern is to show how the price-cost equilibrium will be reached in respect of each seller and then to indicate in what manner the various equilibria relating to different sellers could be fused into a determinate and stable market.

Write x_{Ma_1}, x_{Ma_2}, x_{Ma_3} for quantities of a_1, a_2 and a_3 being sold at y_{Ma_1}, y_{Ma_2}, y_{Ma_3} prices by respective dealers from A, B, and C in the country

M. We shall then have the following demand functions each with three variables:

$$x_{Ma1} = \phi_{Ma1}\,(y_{Ma1}, y_{Ma2}, y_{Ma3})$$
$$x_{Ma2} = \phi_{Ma2}\,(y_{Ma1}, y_{Ma2}, y_{Ma3})$$
$$x_{Ma3} = \phi_{Ma3}\,(y_{Ma1}, y_{Ma2}, y_{Ma3})$$

Then we have the following conjectural demand functions in explicit form:[1]

$$x_{Ma1} = \phi^*_{Ma1}\,(y_{Ma1}, y^*_{Ma2}, y^*_{Ma3})$$
$$x_{Ma2} = \phi^*_{Ma2}\,(y_{Ma2}, y^*_{Ma1}, y^*_{Ma3})$$
$$x_{Ma3} = \phi^*_{Ma3}\,(y_{Ma3}, y^*_{Ma1}, y^*_{Ma2})$$

From these, we have three estimated total revenue functions R_{Ma1}, R_{Ma2} and R_{Ma3} corresponding to each of the three above.

The total cost functions will be:

$$\pi_{Aa1} = F_{Aa1}\,(Q^*_{S,\,Aa1}) \qquad [\,Q^*_{S,\,Aa1} \equiv x^*_{Ma1}\,]$$
$$\pi_{Ba2} = F_{Ba2}\,(Q^*_{S,\,Ba2}) \qquad [\,Q^*_{S,\,Ba2} \equiv x^*_{Ma2}\,]$$
$$\pi_{Ca3} = F_{Ca3}\,(Q^*_{S,\,Ca3}) \qquad [\,Q^*_{S,\,Ca3} \equiv x^*_{Ma3}\,]$$

The conditions of individual equilibrium will be given by the familiar equation:

$$R^{*\prime}_{Ma1} = F'_{Aa1}\; z\frac{A}{M}$$
$$R^{*\prime}_{Ma2} = F'_{Ba2}\; z\frac{B}{M}$$
$$R^{*\prime}_{Ma3} = F'_{Ca3}\; z\frac{C}{M}$$

The second order condition may be neglected since the variables are more than two.

[1] If we treat the estimate functions as implicit ones following Ragnar Frisch's analysis they will be written in terms of coefficients of conjectural variation as in the last section:

$$x_{Ma1} = \phi_{Ma1}\left(y_{Ma1}, y_{Ma2}\frac{\partial y_{Ma2}}{\partial y_{Ma1}}, y_{Ma3}\frac{\partial y_{Ma3}}{\partial y_{Ma1}}\right)$$

$$x_{Ma2} = \phi_{Ma2}\left(y_{Ma2}, y_{Ma1}\frac{\partial y_{Ma1}}{\partial y_{Ma2}}, y_{Ma3}\frac{\partial y_{Ma3}}{\partial y_{Ma2}}\right)$$

$$x_{Ma3} = \phi_{Ma3}\left(y_{Ma3}, y_{Ma1}\frac{\partial y_{Ma1}}{\partial y_{Ma3}}, y_{Ma2}\frac{\partial y_{Ma2}}{\partial y_{Ma3}}\right)$$

whichever method we follow in writing these functions—that of Frisch or of Smithies—our conclusions will be identical.

iii

The way has been cleared for a close scrutiny of the process of price conjectures as between the rival sellers of a_1, a_2 and a_3 so as to find out the conditions of stable equilibrium in respect of their interconnected markets. The duopolic process analysed in sect. i gives us valuable clues to the understanding of the oligopolic one. Here we are concerned with three sellers each one of whom acts on the belief that his own action has particular reactions on his two rivals. There arise three types of beliefs and the resultant price adjustment paths built upon these. (*a*) If the seller were to raise his price or conversely to lower it, both of his rivals will simultaneously take the same course. Here the expected price reactions of the rivals are in the same direction as his own price-change. (b) Should he raise the price or lower it the rivals will simultaneously do the reverse. Here the expected reactions are in opposite direction to the price-change contemplated by the seller. (c) In case the seller increases or decreases his price, one rival will take the same but the other a reverse course. In this case the expected reactions are themselves in opposite directions *inter se*.

Let us start with the (a) type of conjectures. The first sellers selling a_1 product puts up his price at $_1Pa_1$ basing it upon his estimated demand curve as the English seller did in the former regime of duopoly. When he moves forward from $_1Pa_1$ to $_2Pa_1$ in an upward direction, the second seller will similarly move up from $_1Pa_2$ to $_2Pa_2$ and the third from $_1Pa_3$ to $_2Pa_3$. The price movements of each seller will be readjusted according to his re-drawn estimated demand curves. As in the former situation the loci of price-points tentatively set up by each seller will trace a series of his upward sloping price-conjecture curves. As before the limits of this curve series will be set by the average cost for zero and optimum outputs of the respective sellers (*ante* p. 88).

Now turn to the downward price movements which will follow if the seller of *a1* raises his price from *1Pa1* to *2Pa1* and thereafter goes on lowering it to *3Pa1*, *4Pa1* by successive steps while his competitors also follow similar policies. This means there is now com-

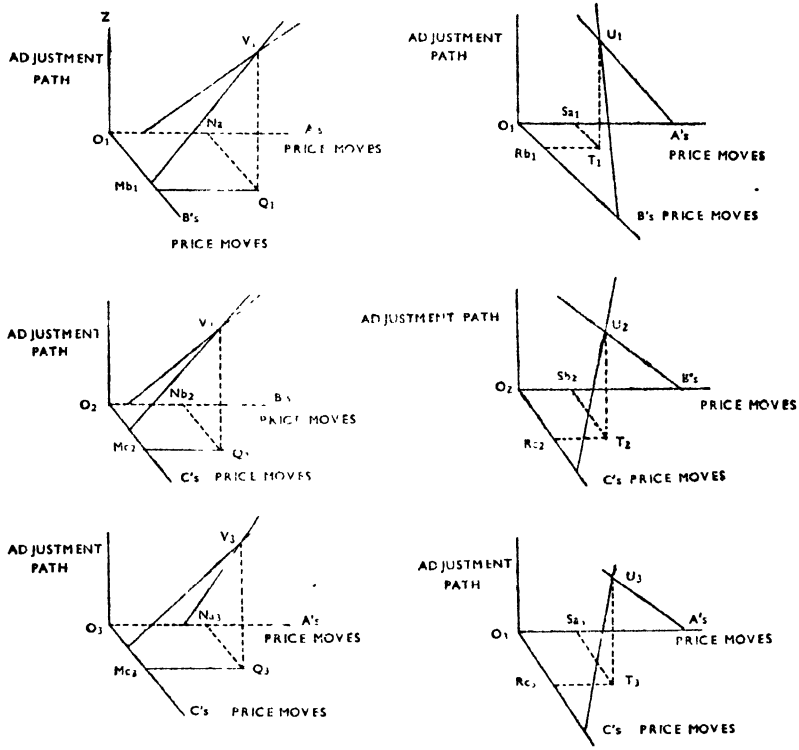


FIGURE 11

EQUILIBRIUM OF ADJUSTMENT PATHS REQUIRES:

$O_1 Na_1 = O_1 Na_1$ $\quad O_1 Sa_1 = O_1 Ra_1$

$O_1 Mb_1 = O_2 Nb_2$ $\quad O_1 Rb_1 = O_2 S_2 b_2$

$O_2 Mc_2 = O_3 Mc_3$ $\quad O_2 Rc_2 = O_3 Rc_3$

$V_1 Q_1 = V_2 Q_2 = V_3 Q_3$ $\quad U_1 T_1 = U_2 T_2 = U_3 T_3$

petitive price-cutting in respect of *a1*, *a2* and *a3* and the successive estimated curves of the first, second and third sellers will lie one below the other, the degree of shift being greater than under duopolic conditions.

The sellers' price-conjecture curves will be downward sloping. But the limits of price-cutting will be set by the minimum points on the respective average cost curves.[1]

The price adjustment paths of the three sellers are shown in Fig. 11 sections (i), (ii) and (iii). The first of these is concerned with *A* and *B* sellers. The second with *B* and *C* sellers and the third with *A* and *C* ones —in each case their prices raised or lowered simultaneously.

When all the three sellers raise or lower their prices simultaneously in the manner shown above, determinate equilibrium in their markets can obtain only if their conjectural curves all intersect at a single point, and that point indicates equality of their estimated marginal revenue ratios with actual marginal cost ratios. That is

$$\frac{ny_{Ma1}}{ny_{Ma2}} = \frac{R^{*\prime}{}_{Ma1}}{R^{*\prime}{}_{Ma2}} = \frac{F'_{Aa1}}{F'_{Ba2}} \frac{z^{A}_{M}}{z^{B}_{M}}$$

and similarly for *a1* and *a3* and *a2* and *a3*.

Next consider the (b) type of price anticipation whereby a seller takes it for granted that both his rivals will act in the opposite direction to his own price-moves. Let the first seller move from *oPa1* to *1Pa1* and from there to raise the price to *2Pa1*. When he does this his rivals cut their prices from *1Pa2* to *2Pa2* and *1Pa3* to *2Pa3*. Now the first seller will have to readjust his demand estimates in order to protect his market from the rival price-cutting. Thus he takes the third step by lowering his price from *2Pa1* to *3Pa1*. Now his price-cut will depend upon the cross elasticity of demand for rival products as estimated by the first seller. In other words on what he considers to be the power of his second and third seller to lure away his customers at the price *2Pa1* by cutting their prices. The higher this estimated elasticity, the greater will be the price-cut which the first seller will feel

[1]It is assumed that price is not driven below the average cost.

called upon to bid so as to meet the rival moves. When he does this, the second and third seller will now be induced to raise their prices from *2Pa2* to *3Pa2* and *2Pa3* to *3Pa3*, but this price-rise will not be as much as the former price-cut provided the elasticity of

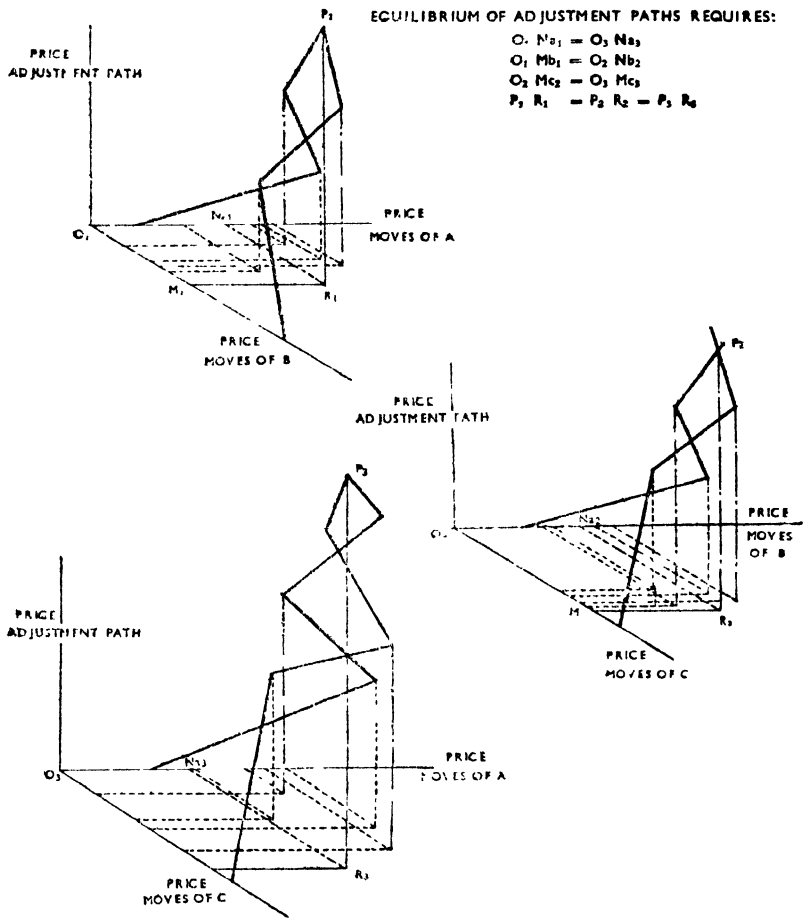


FIGURE 12

demand for their product is diminishing as would be the case under all normal cases. The subsequent move on the part of the first and the other two sellers will alternate in a similar way, but the amplitude of

price-rises and price-cuts will go on diminishing. The condition of equilibrium will be the same as laid down above.

From the above it is manifest that the successive estimated curves of the first seller will shift upwards and downwards, but the degree of shift will become smaller, as he proceeds on his adjustment path. This will hold good equally for the second and third sellers. The simultaneous price-adjustments of the first and second as also the first and third sellers can be shown as in Fig. 12.

Finally examine the (c) type of rival anticipation wherein the first seller believes that the second seller will follow suit, but the third seller will not do so. In this case the postulated behaviour of rivals is asymmetrical. Hence the first seller will have to conjecture the opposite effects of the price-polcies of the rivals, and their resultant effect on his own market. The price-movements of the first seller may now be upwards throughout or downwards throughout or they may alternately be upwards and downwards. This depends on whether the first seller estimates resultant effect of the second and third seller's policies to be in the same direction as his own or else in the opposite direction. Since it is not possible to say how he will conjecture rival behaviour at every step, his price-adjustments cannot be charted out in the determinate way as in the case of the previous two anticipation-types unless fresh assumptions are introduced.[1] The same is true about the second and third seller whose price-adjustments will be similarly indeterminate. The market equilibrium can therefore be determinate and stable if by *fortuitous circumstances* the separate price-adjustments of the three sellers intersect at a point which satisfies the marginal revenue-cost condition laid down above.

[1]It is legitimate to suppose that every competitor makes his adjustment on the basis of *mean* values of conjectural positive (upward) and negative (downward) changes in the rival prices, and that these mean values turn out to be correct

iv

The advent of advertising and direct selling into our oligopolic trade system will call for a rewriting of estimated demand and revenue functions of an export seller from A, B, C competing in the country M; we shall have a new selling cost variable which, along with the price of the product, determines the sale estimates of every exporter. The revised functions may be written in the same manner as shown in mod. A of sect. ii above. The total cost functions of all the three sellers will, however, remain unaffected by the influx of selling cost policy as was the case under duopolic trade.

The condition of individual equilibrium will therefore be as follows

$$\frac{\partial(x_{Ma1}\, y_{Ma1})}{\partial y_{Ma1}}\, dy_{Ma1} + \frac{\partial(x_{Ma1}\, y_{Ma1})}{\partial S_{Ma1}}\, dS_{Ma1} + \frac{\partial(x_{Ma1}\, y_{Ma1})}{\partial y_{Ma2}}\, dy_{Ma2} + \frac{\partial(x_{Ma1}\, y_{Ma1})}{\partial y_{Ma3}}\, dy_{Ma3} = \frac{\partial F_{Aa1}}{\partial x_{Ma1}} \cdot Z_{M}^{A} + \frac{\partial S_{Ma1}}{\partial x_{Ma1}} .$$

And similarly for the sellers of $a2$ and $a3$.

The analysis of selling costs under duopoly had revealed that its primary purpose is to increase quantity of sales because prices are more or less rigid and could not be altered by any selling device. It was also seen that since the selling cost function of every seller does not rise or fall at the same rate as his production cost function, therefore the estimated output for which marginal revenue is equal to marginal production cost will not always be the same as that for which the former is equal to marginal selling cost. For this reason the equilibrium output of different sellers will be indeterminate when they resort to advertising and direct selling. The same conclusions apply to the present situation but with one reservation. Since there are now three varieties competing in the market

and elasticity of commodity substitution has risen competitive advertising and direct selling will be less effective in increasing sales, that is to say, the selling costs will rise faster to scale than under duopolic trading. Hence there is now greater likelihood of the rates of production and sale costs coming closer to one another and in the limiting case being identical. If this were the case the market situation would be stable. In other words the following stability condition, similar to the duopolic one, will be fulfilled.

$$\frac{ny_{Ma1}}{ny_{Ma2}} = \frac{R^{*\prime}_{Ma1}}{R^{*\prime}_{Ma2}} = \frac{F'_{Aa1}\left(Q^*_{S,\,Aa1}\right) Z^{A}_{M} + \dfrac{\partial S_{Ma1}}{\partial x^*_{Ma1}}}{F'_{Ba2}\left(Q^*_{S,\,Ba2}\right) Z^{B}_{M} + \dfrac{\partial S_{Ma2}}{\partial x^*_{Ma2}}}$$

And similarly for *a1* and *a3*, and *a2* and *a3*.

The above analysis assumes that the advent of oligopoly tends to saturate the market with high competitive products which are in extensive use. But such an assumption is not always warranted by the facts of the trading world. Imperfect markets may be developed or the products which are being sold may have new potential uses.[1] In such cases the market does not tend to be denser by the incursion of oligopolists. And under such conditions advertising and direct selling outlays will fall proportionately to sales which can be expanded by all sellers without any danger of wasteful selling effort. If such a market situation were to exist, the selling cost equilibirum of *A*, *B*, *C* sellers would be indeterminate as was the case with duopolic equilibrium in our previous model.

In attempting to appraise the effects of selling costs on oligopolic markets, we should take account of two types of advertising. First, a new entrant has to incur heavy advertising outlays so as to win the goodwill of buyers for his own concern and to impress indelibly

[1]Redmayne and Weeks, *Market Research*, p 142. Here will be found an account of how advertising when based on properly conducted market surveys leads to the development of the market.

upon their minds the qualitative appeal of his product.[1] These are fixed costs and as such form part of the cost of entry. Burns maintains, 'if large sums are needed to build up are putation for product, potential competitors are discouraged and abnormal profits may persist for a long time'.[2] Secondly, every well-established seller has to incur definite sale expenditure on advertising as also direct selling in order to maintain his market and prevent his rivals from capturing it. The main purpose is to keep the product constantly before the public and therefore continuity of advertising is essential.[3] In fact much of oligopolic advertising is undertaken with a view to protecting one's own and encroaching into the rival's market. It is this second type of advertising which becomes competitive and often runs to waste since it neutralizes rival efforts leaving production costs and output unaffected. When sellers find that advertising is losing its effectiveness owing to competitiveness, they seek to bring about changes in patterning and processing of their products and develop hitherto unknown uses for these.[4] But there are limitations imposed on the seller by his own technological equipment as also by his cost schedules of product variations. It is therefore evident that advertising and product variations will not have much scope for increasing sales when the number of rivals grows from two to three and more. Direct selling will also have smaller scope for sales expansion under such conditions. Sellers would be led by the pressure of competition to push on their selling expenditures to a point where their marginal total cost ratios are equated to their marginal revenue ratios. Hence sales equilibrium will tend towards stability.

In the real world of foreign trade it is difficult to forecast the effects of selling policies because the

[1] V G Collins calls this type of advertising institutional as distinguished from merchandize advertising. See his *World Marketing*, pp. 172-4.

[2] A R Burns, *The Decline of Competition*, p 386

[3] Burns, op cit., p. 384, Margaret Reid, *Consumers and the Market*, p. 330.

[4] Redmayne and Weeks, op cit., pp. 141-4

buyers' reactions are themselves unpredictable.[1] The greater the number of competing sellers and more diverse their efforts in respect of advertising, the greater would be the uncertainty attendant upon the outcome of their efforts. This is equally true about direct selling methods. But as a matter of fact these are launched mainly to develop the market of the seller's product as well as allied products exported from his country. It is, therefore, a long term investment spread over many export industries all struggling to capture the foreign market.[2] From this it should be clear that time and uncertainty are of the essence of oligopolic policies of advertising and direct selling. Here come into view the limitations of static analysis in the way of a fuller discussion of this subject.

V

Let us now relax assumption (ii) set out at the outset. By doing so we shall now provide that the number of varieties in which a to j commodity-types sell in the trade market are not fixed any more, but could be increased or diminished according to prevailing demand conditions. And further, there now exist no predetermined directions of trade in a to j types so that any country A to L is now free to export any differentiated product. These changes will undoubtedly bring us nearer the facts of the real world. Our concern is now to find out how the conclusions so far reached need to be revised in the light of the modified data.

While allowing free variation in the number of competing varieties in the trade markets, we must first guard against the risk of stultifying the main postulate with which we started, viz. the exporters of competing varieties from various countries are oligopolists. The condition of fewness of sellers implies that each has to consider the possible reaction of his price-output moves

[1]The uncertainty of advertising reactions is discussed by H Smith, 'Imputation of Advertising Costs' *E.J* Vol. XLVI 1936. Also Redmayne and Weeks, p 169. For a fuller study of the subject consult A. T. Poffenberger, *Psychology in Advertising.*

[2]For a full discussion of the economics of direct selling, see *P. E P. Report*, p. 137.

on the policies of the rivals. If their number as also the products they sell begin to rise indefinitely it will gradually reduce the imperfection of the market, and thereby the degree of control which each seller can exercise on his market will decline.[1] The limit of oligopolic competition is set by cross-price elasticities of demand, e. g., $\frac{p_1}{x_1}\frac{dx_2}{dp_1}$, $\frac{p_2}{x_2}\frac{dx_1}{dp_2}$ when $p_1 = \psi_1(x_1)$ and $p_2 = \psi_2(x_2)$.[2] If the elasticities were greater than unity under this condition the competitors would find that a small change in price gives a more than proportionate change in the volume of demand of rival products. As the number of competitors increase the cross-price elasticities rise. This implies that the reaction curves of the competitors will become flatter, in other words the successive adjustments will come close together and ultimately these will become horizontal straight lines indicating that each seller takes the market price to be given.

Turn now to the question of trade directions as between M countries under perfectly competitive conditions : a country exports those goods which, at the given level of world demand, can be produced most advantageously. This she would continue to do in a regime of oligopoly or any other regime, so long as the basic postulate of profit maximization guides her economic behaviour. The difference lies in how comparative advantage between one line of export trade and another is estimated in oligopolic as opposed to competitive trading. In the latter, the traders compare the marginal costs (minimum average costs) entailed in alternative lines and choose those in which they can be equalized with the world level of prices given as data. In oligopoly there is no single price-level which all traders from different countries must regard as given. The world market is segmented and

[1]cf. Edgeworth, 'The extent of indeterminateness diminishes with the diminution of the degree of correlation between the articles', *Papers* Vol. I, p. 121.

[2]R. G. D Allen, *Mathematical Analysis*, p 311

every seller (or group of sellers) from each exporting country comes to have a separate demand curve which is essentially an estimated demand curve based upon the seller's estimate of his own and his rival's selling power. Faced with competing lines of production for export, he will set over against marginal costs (average costs) the estimated marginal sale revenues in each of such lines and choose that line wherein the two margins can be equated. If the oligopolists from different countries are in effective competition, it follows that according to the tangency theorem, price will also be equated with average cost. The main point of interest is that while entering this or that line of employment, the export seller will compute the expected revenues in the rival lines in terms of his selling power.[1] He will have various degrees of selling power in different export markets because of the differences in the number of sellers and their control in those markets. In judging his own selling power the trader will try to see how far he can gain a secure foothold in the foreign markets, how he can maintain and widen it by encroaching into the area of his rivals. He will also take into account the effect of selling outlays and direct sale campaigns.[2] An objective measure of selling power of rival traders is given by cross-price elasticities of demand, since the former must manifest itself in the changes in sales of his rivals resulting from a small change in the price of a seller.

The decisions of traders as regards relative profitability of competing lines are equally based on what they consider to be 'normal' profits which is functionally related to their selling power. The term normal profits has raised a good deal of controversy in recent economic literature. In this connexion Dr Machlup has recently pointed out that profits are normal when the earnings of the fixed factors (hired or owned)

[1]This concept is fully discussed by R. G Hawtrey in his *Economic Destiny*, ch. II

[2]A good deal of advertising and direct selling of an entrant is designed to build up goodwill. Direct selling is undertaken with the additional purpose of intensifying the sales of by-products

allocated to an industry are equal to their opportunity-costs. They are abnormal when their flow into the industry is obstructed although the earnings have risen above the opportunity cost level. Supernormality of profits is a symptom of dis-equilibrium which can only be repaired by the entry of new resources.[1] This holds good in international as well as in domestic trade. The exporting industrialists of a country will invest their resources in those lines where supernormal profits are being reaped and in which there exist fair prospects of earning normal profits in what they regard to be the long run. But since it is an oligopoly which they want to enter, the cost of entry is high and the main difficulty will be to gain a foothold in the market and, once this is gained, to maintain it so that the abnormal profits may not be competed away. Thus whether we look at the question from the angle of marginal cost-revenue parity or that of normalcy of profits, the same conclusion is reached. Within the framework of industrial costs in different lines of differentiated export a country's traders would choose those which they expect to afford fullest scope for market control, in other words, for their selling power relatively. Numerous countries and numerous varieties would enter into those lines of export in which market control is relatively easier to acquire and to maintain ; in other words, it is possible to produce and sell many differentiated products. Conversely, fewer countries and a smaller number of products would obtain wherein market entry and control were relatively difficult. The trade situation is, therefore, affected by estimates of sellers about entry and control, and stability of world trading depends on whether the rival estimates from different countries are mutually consistent in respect of price and cost ratios.

[1]Fritz Machlup, 'Competition, Pliopoly and Profit' *Econ. N. S.* Vol IX (1942) and R. G Hawtrey, 'Competition From Newcomers' *Econ N. S,* Vol X (1943).

vi

So far we have confined our attention to oligopolic sellers from A, B and C all trading in the Mth country, thereby leaving out of account the trade operations in each one of A, B or C countries. Let us now proceed to these trade markets. This would bring us to the total trade equilibrium as between all the four countries.

There now come into view three additional groups of export sellers : those from B, C and M selling their wares in A, then those from A, C and M, selling in B and finally those from A, B and M selling in C. Export sales in the foreign markets would be entrusted to direct branch houses and retail merchants. Now in each of A,B and C markets, two differentiated products and one homogeneous product are sold and it follows that the former would be priced according to duopolic selling prices,[1] while the latter according to competitive policies. We have already examined in the previous chapters how both the sorts of policies are framed. Our findings regarding these will therefore hold good in respect of A, B and C trade-markets.

To the quantities of imports and exports exchanged between all the four countries and the prices paid for them in each country, the Yntema identities and general equations will be applicable, provided that the individual equilibrium in respect of each differentiated product are determinate and stable. The trade equilibrium of every country will be indicated by its ratio of exchange whose stability would depend upon that of individual commodity equilibria. Between the four countries there will be three ratios any one determining the rest. Approximate to each ratio there will be terms of trade-ratios of import to export prices between one country and another.

This brings us to consider the specific effects of product differentiation on the general trade situation in A, B, C and M countries. These effects could be

[1]Here again we shall assume there is no competition between home-produced and imported products.

studied with respect to the prices ruling under the regime of perfectly competitive and monopolistic regimes and, secondly, the total volume of trade under these regimes.

The import and export price movements under each situation can be traced only with the aid of demand-and-supply elasticity further qualified by the import substitution effect as considered in ch. iii mod. C, sect. viii. It is difficult to say without further data how these elasticities would be affected by the advent of product differentiation. It is very probable the country which sends out a smaller range of goods will have a higher elasticity of import substitution and hence it will obtain its imports cheaper.[1] But its export products will have to compete with the differentiated products from other countries and the foreign markets ; it may possess weak selling power and hence earn relatively small profits.

The volume of trade in each country is bound to decline below the competitive level because of the restrictionist policies of the sellers. But as compared with monopoly and duopoly regimes the volume will be higher because the competition between the sellers cannot but weaken their control on the commodity market and thereby raise the demand elasticity of the product of every seller.

Though the volume of traded goods may have fallen below the competitive norm, there is now a greater variety of products. Sellers are now able to satisfy the individualistic preferences which could not be catered for under the competitive regime. In this respect it is necessary to keep in mind that the demand for specially processed individualist varieties arises and grows with the standard of living in the trading countries.[2]

vii

We shall now pass on to the question as to how variations in the terms of trade affect the stability of

[1]cf. ch. iii, mod. C, sect. viii.
[2]*P. E. P Report*, p 141

world production and export of differentiated as opposed to homogeneous goods. When competition is perfect and goods homogeneous we know that a rise or fall in their prices would readily lead to an expansion or reduction of output by every trading firm ; and simultaneously with this, the entrance of new or exodus of old firms. Under such conditions, if comparative cost ratios between one country and another are narrow a variation in terms would involve movement of resources from one enterprise to another which must bring about instability of employment.[1] Contrast this with the state of affairs when competition is oligopolic and traded goods differentiated. Now a rise or fall in the prices of differentiated products will not readily induce new firms or force out old ones, although it should result in the variation in the output and profits of all established firms. The main point is that the variation of prices does not set into motion all at once the free inflow and outflow of factors.[2] The output of the established firms is primarily determined by their user (variable) costs and excess capacity. Though under such a regime of imperfect competition there may exist narrow differences in the cost ratios as between one country and another, these would not necessarily result in the fluctuations in the *channels* of employment and trade. The wind of circumstance which Robertson warns as a harbinger of instability will be brought under check by the restrictionist policies of oligopolists. They are free to augment their output or deplete it, suffering reduction or reaping increase in their monopoly gains. They will try and push their sales by advertising and other devices so as to offset the effects of falling prices.[3] And beside all this they can take recourse to product variation in order to create fresh demand for their 'commodity'

[1]Robertson, 'The Future of International Trade' *E. J* Vol XLIX (1939)

[2]Fritz Machlup, *Econ N. S* Vol IX (1942).

[3]V. D Reid takes the view (*Planned Marketing*, pp 250-2) that 'advertising makes price reduction possible if desirable without destroying or reducing profits and that it paves the way for price increases' ; op cit., p.327.

and thus to make good the loss of market suffered by price reduction or intrusion of new rivals.

Finally, the sellers are free to have either tacit price agreements among themselves or else to follow the price leadership of the major concern or concerns. This last seems to be more common than agreements or combinations among the sellers.[1] As a result of this last feature prices under oligopolic competition tend to be rigid and institutionalized and consequently fluctuations are minimized. Now all of these characteristics coexist with surplus productive capacity and effective barriers against entry of new sellers. Thus the stability of employment is ensured at the cost of freedom of enterprises and sub-optimal production. Hence arises the ultimate question carrying us into the realm of ends.[2] Shall we have security and stability on the one hand, or, on the other, freedom and disposal of economic control ?

Model C

i

In occupations where the competing field is invaded by many sellers the excess capacity of each is diminished and thus insurance against unforeseen changes in demand lowered. The polypolic competition between them, though assured of stability under analytical assumptions, does in practice lead to instability of prices and production. Actual conditions in the business world indicate that 'in periods of expanding demand competing producers in the aggregate tend to overshoot the mark and in periods of contracting demand to fall short of it'.[3] These market fluctuations, especially characteristic of booms and depressions,

[1]See Burns, op cit, pp. 76-140 Dennison and Galbraith, op cit., pp. 36-77, 55 Also A J Nicol, *Price Leadership and Price Policy*. The analytical exposition of price leadership is to be found in Kahn's 'Problem of Duopoly' *E J* Vol XLVIII (1938).

[2]This is the question which Kaldor asks in his review of Triffin's monograph *Econ. N S* Vol. IX (1942)

[3]Pigou, 'Stabilization of Particular Industries', *Economic Essays and Addresses*, p. 38

provide an effective incentive for rival producers to come to agreement among themselves usually under the aegis of a price or output leader. The membership of such a block is compulsory on pain of price and sales warfare waged with the object of coercing recalcitrant firms into submission.

The most significant forms of such industrial agreements are the cartels whose scope has extended beyond the domestic to international markets. The international cartels are of two types: first, those which aim at the restriction of aggregate production in all the countries by means of centralized control; secondly, those which divide up the international market into regional zones and aim at the control of regional production by means of decentralized controls. Since the former type cuts across national boundaries and makes for international control of prices and outputs, its effects are spread over the whole range of countries which participate in cartellization. On the other hand the regional cartels operate as monopolies of the home market and hence their effects are directly noticeable on the domestic level of prices and employment.

ii

Let us begin with the analysis of the first type which aims at production or price control of the commodity concerned on an international scale. Assume that three countries A, B and C cartellize a product X and allocate quotas of x_1, x_2 and x_3 in the respective countries. It is manifest that if they are to reap monopoly profits they must sell the product in different parts of the world so that, allowing for differences in transport costs and exchange ratios,

$$R'(x_1 + x_2 + x_3) = F'(x_1 + x_2 + x_3)$$

and $$R''(x_1 + x_2 + x_3) > F''(x_1 + x_2 + x_3)$$

so that the selling price is equal to $F'(\eta_x/\eta_x - 1)$. Where η_x is the elasticity of total sales $x_1 + x_2 + x_3$. The determination of equilibrium output and price

will, however, be rendered difficult because of the differences in production costs in the producing centres and the transport costs as between these and the consuming centres. Yet the pooling together of market information would greatly assist in the adjustment of price and costs to conditions of demands.

The success of the cartel in maintaining monopolistic prices and profits will be conditional upon the proportion of its aggregate output to the total world output. The ideal proportion is, of course, such that the marginal supply price of the cartel output is equal to demand price at the consuming centres multiplied by $\frac{\eta_c - 1}{\eta_w}$. This proportion may fail to be reached or, if reached, the cartel members may prefer not to exact the monopoly price. The real difficulty arises when the producers in non-member countries expand their output and threaten the monopolistic position of the cartel in the domestic market. There arises a situation that leads to price-war between the two parties characterized by dumping. The cartel undersells the product in the foreign market discriminated from the home market with a view to driving out the foreign producers. The struggle is likely to result in forcing producers into the cartel agreement, but it is probable that the agreement may be unstable in duration in which case recurrent price-wars are bound to ensue.

Now consider the question arising in this connexion: how will the cartel policy be adapted to changes in the conditions of demand? In a period of falling prices signifying a decline in effective demand and a slump in business conditions, the cartel will aim at restricting or 'valorizing' the output of its members at the low prices ruling in the home and export markets. The excess capacity will rise and falling prices will make it increasingly difficult to keep a stable level of profits. If the cartel policy is far-sighted, it must be careful to build up buffer stocks for the period of rising prices

in the following boom so that there may be little difficulty in catering for the expanded demand and reducing the amplitude of the boom in the particular market. The restrictionist policy of the cartel during the depression will injure the consumer provided the prices are maintained at rigid levels and no buffer stocks are built up.[1] The tendency of cartels to maintain rigid prices is borne out by many instances in the last depression.[2] Once the cartel has passed through the slump into the period of boom, its members may be tempted to keep up the excess capacity and high prices in which case the injury to the consumers will be greater still. Yet in this period fresh enterprise can try to enter the industry and thereby break up the monopolistic control of the cartel. There again a wise and far-sighted policy demands that the cartel should reduce its prices, draw upon its buffer pool, expand the output and thereby help the consumers in sharing the benefits of prosperity. Actual experience in this respect shows that cartels do not pursue such policy and, therefore, tend to break under the strain of commodity substitution by the consumers and the incursion of fresh enterprise into the industry.[3]

International cartels of the centralized type are thus subject to difficulties inherent in maintaining a monopolist price-output policy through changing market conditions. Herein there is a greater possibility of consumers' interests being sacirficed and outside competition being stimulated into action. Apart from these difficulties the task of administering a world-wide organization of producers' and distributors is

[1] cf. Karl Pribram, *Cartel Problems*, p. 121 ff. for the effects of price-stabilization.

[2] J W. F. Rowe observes, 'nearly all the available evidence, unfortunately, supports the fear that if a restriction scheme is successful, the price will be raised far higher than is necessary from the consumers' point of view, or desirable in the long-run interests of the industries'; *Markets and Men*, p. 214

[3] *P E P. Report* points out 'many cartel agreements in the past having assisted the industry concerned to weather a slump, have broken down under the stress of temptations in the subsequent boom' (p. 96). And further, 'cartels which have set out to control the market through control of production, have been vulnerable in times of boom to outside pressure' (p. 97).

beset with obstacles which few cartels can overcome for a long period.[1] Cartels of this type are, therefore, prone to be unstable and unsuccessful in achieving their aims.

iii

Next we shall examine the regional type of cartels in which countries *A*, *B* and *C* delimit their marketing zones and leave price and output control in the domestic markets entirely to the individual members concerned.[2] The latter are, however, subject to export their output into free-market zones according to agreed quotas. By this arrangement international competition both in the domestic as well as the foreign markets is sought to be reduced to the minimum.

As regards the condition of profit maximization and output restriction, the general equations will apply as in the preceding type of cartel. No new issue is presented in this respect. The determination of equilibrium output will be relatively easier in this type, because the national cartel has to consider its own market only. The new feature in the situation is the quota of exportable output assigned to *A*, *B* and *C* and the price which each of them frames for the free markets. The most profitable quota for each country will be such that, at the given level of export prices, it ensures the national cartel a 'neighbourhood monopoly'[3] based on transport costs and lack of internal sources of supply in the importing markets. Such a one is difficult to secure, yet by means of buying the quotas of other countries or by imposing taxes on the entry of products from rival quota-members, the national cartel can secure a virtual export monopoly of the neighbouring markets. In case no such monopolistic control is possible, the national cartel of *A*, *B*

[1]The main obstacle is that of supervising the price-output policies of member countries and checking any surreptitious breaches of the agreements

[2]*P. E. P. Report* (p. 124) has shown how these types of cartel agreements have become more important and successful in the recent years

[3]Marshall, *Money, Credit and Commerce*, p. 204.

or *C* will have to sell its product in the importing centres in competition with other cartels who may also have secured a quota for the same destination. In the event of export monopoly being established the analysis of monopolistic trading (ch. iii, model B) will apply. On the other hand, in case there is competition between two or three cartel-members the analysis of duopolic and oligopolic trade (ch. iv, models A and B) will be applicable.

Let us now come back to the question raised in the previous section : how does the national cartel adjust its market policy according to changing business conditions ? In respect of the general policy during falling and rising prices, this cartel type does not differ from the former type and hence all the considerations of the previous section hold. Two reservations need, however, to be noted. Here we have a cartel on which each national group has obtained an uncontested control over the home market and hence has attained the status of a domestic monopoly. The consumers in each country have, therefore, come wholly within the sway of cartel control from which there could be no relief by means of the imports from other countries save under the remote possibility of the latter refusing to join the cartel agreement. From this situation they can only be protected by direct governmental intervention or else by the development of rival enterprise.[1]

iv

Taking the two types of cartels together we shall now attempt an appraisal of their effects on prices, volume of trade and the factor market.

A long and impressive list of advantages can be compiled on behalf of combines and cartels : they reduce the number of middlemen, make possible many internal economies, abolish dumping, minimize sales

[1]According to the *P. E. P. Report* the system of export control by the second type of cartels 'gives rise to certain dangers, first, of exploitation by consumers in closed home markets, and, second, of exploitation of free markets which have no domestic source of production' (p 98).

costs and redundant patterns and so on.[1] These are the effects of vertical and horizontal combination which make for a reduction of production and selling costs. 'Yet there may be no guarantee that the consumers and wage earners will not be worse off after these economies and advantages have been realized by an international combine.'[2] As forms of monopolist undertaking international cartels must necessarily imply the restriction of output below optimum capacity and the maintenance of high prices. If, as we have seen in the last two sections, the cartels pay greater attention to the consumers' interests and long-run stability, the restrictionist policy may be offset by expansionist planning especially in times of prosperity. New innovations may be adopted, obsolescent plants scrapped, prices made flexible and in all these ways the monopolistic control may be relaxed.[3] These measures are, however, not usually adopted by strongly entrenched cartels especially of raw materials. Against them there exists no serious threat of potential competition, save that from substitutes developed with the aid of technical knowledge. No doubt such sort of substitutes have been developed in recent times for many cartellized raw materials.[4] These are, however relatively more costly and, therefore, bound to raise the price of the finished product, thereby burdening the consumer with high prices and injuring his welfare. Inside the cartel itself the high-cost producer is given a lease of profitable existence, and risk-bearing is reduced to the minimum. The most potent evil of the cartel trading is 'to stereotype the conditions of production in favour of the high-cost producers'.[5]

[1]See Alfred Plummer, *International Combines in Modern Industry*, pp. 182-3.

[2]op. cit., p 283.

[3]Plummer maintains that a 'wise and beneficial policy of price stabilization must aim at "ironing out" the peaks, as well as raising the valleys, of price fluctuations', op. cit., p. 197.

[4]Plummer, op. cit , pp. 188 ff. for the conditions under which potential competition can grow, and for a detailed account about the recent development of substitutes for the cartellized products.

[5]Lionel Robbins, *Economic Planning and International Order*, p. 136. Rowe, op. cit , pp. 214-15

As a consequence cartel prices tend to be unduly high and over-capitalization within the industry may proceed unchecked. The price and output policies of most of the strongly organized cartels, especially of raw materials, have been restrictionist rather than expansionist, and hence their effects have been unfavourable on the trend of world trade. Few among these cartels have fulfilled the hope that 'the growth in the scale of control and of responsibility, as also the increased security against intermittent competitive raids, will lessen the purely profit-making motives with which these national concerns are conducted, and enhance the conception of public service'.[1]

In the end it remains to note the general effects of cartel on the employment of hired factors. The 'rationalization' of cartel industries must necessarily imply the substitution of machine processes for manual labour and thus entail the unemployment of the former. On the other hand the establishment of a steady and long-range cartel policy will ensure a steady level of employment of factors in the industry though there must be exploitation of wage-earners on the familiar principles of monopsony theory. If the cartel expands its output it will mean a large volume of employment and probably a higher level of wages to the labourers. Yet these advantages are to be secured at the cost of consumers unless the cartel expansion is accompanied by price reduction. The class of labour employed in the cartellized industry will secure a rise in money wages at the cost of labouring classes in other industries.[2] International cartels and monopolies are beneficial to the consumers and wage-earners provided only that their formation ushers in lower prices and larger output.

[1] D. H. MacGregor, *International Cartels*, p. 5.

[2] cf. Julius Hirsch, *National and International Monopolies from the point of view of Labour, the Consuming Public and Rationalization*, pp 15-16.

CHAPTER V

WELFARE COMMENTARY ON THE FOREGOING TYPES OF TRADING

At the end of our journey through the many-patterned world of monopoly and imperfect competition there now emerges a clearer picture of the nature of trade relationships in such a world and their divergence from the conditions of perfect competition. Our investigations were confined, however, to the effects of monopoly and oligopoly on prices and volume of import and export trade as also on factor incomes. These do not shed any direct light on another problem, viz. welfare from foreign trade as set out in ch. ii. sect. vii. After the explorations carried out in the foregoing models it should be easier to grapple with this problem in a more concrete way. Our first task is to examine serially the various models of trade under non-perfect competition and thereafter to pass on to a general appraisal of gains in the real world whose complexity lies beyond the range of models we have sought to build.

i

In order to distinguish between the welfare effects of various types of trading we have to go beyond the classical viewpoint. As pointed out in ch. ii. sect. vii the classicists—Ricardo, Mill and Marshall—were interested in showing how the opening of free trade as between two countries tends to ensure maximum gain from the employment of resources. They were concerned with the 'sums of satisfaction' or with consumers' surplus derived from a free and unhindered flow of trade.[1] This is not adequate for the purpose of our analysis. For we are concerned not with an

[1] For an extensive survey Viner's *Studies*, ch. ix may be consulted.

appraisal of welfare from trade as compared with no-trade, but with welfare from trade under different conditions of market control. The best way to attack the problem is to compare the effects of trade activity on the national dividend, under various conditions, of the countries concerned. For this purpose it is essential to postulate that any variation in the national dividend from the sale of exports and buying of imports reflects a corresponding variation in the welfare of the persons inhabiting a trading country. We shall first be concerned in sects. ii to iv with the welfare of the persons in so far as it depends on the volume of foreign trade and thereafter in sect. v we shall consider the aggregate welfare from home and foreign trade.

The instruments we shall employ for our analysis are the national, and the international net (value) product of resources employed in the foreign trade of a country. Let us follow, with necessary modifications, the definitions given by Professor Pigou about products of this type. The marginal national net product in the manner of the marginal social net product, will be 'the total net product of physical things and objective services due to the marginal movement of resources in any given use or place, no matter to whom this product may accrue' ; the word 'whom' in this case is, however, restricted to persons living within a country whose foreign trade is under consideration. On the other hand the marginal private net product is the total net product as above 'which accrues in the first instance that is prior to sale to the person responsible for investing the resources there'.[1] On the analogy of the social net product, the international net product will be due to the marginal increment of resources 'no matter to whom the product accrues' but the word 'whom' will now be extended to persons of *all* the countries who have entered into trade. The distinction between the national and international net product now will be evident. The former refers to the product as accruing to the people of an exporting or

[1] *Economics of Welfare* (4th ed), pp. 134-5.

importing country while the latter is concerned with the product accruing to the persons in the exporting *and* importing country taken together.

Next we shall proceed to the considerations under which the various products as set out above tend to coincide or diverge.

The causes of divergence between the marginal social net product of a resource between one occupation and another are, according to Pigou, four in the main:[1] (i) inadequate knowledge, (ii) obstacle to movement, (iii) imperfect divisibility of resources and (iv) relative variations in the demand for resources from various occupations. These causes apply unequivocally to the national net product of resources of one country as compared to those of another at their respective margins of employment. The most important obstacle is obviously that of movement of resources. At least one factor, labour, will be immobile and as such it will not be possible to equalize the marginal national products of two or more trading countries because of this insuperable obstacle. Factor prices and hence the (value) products will differ as between one country and another by at least the cost of movement. But while under perfect competition price differentials will tend to be equal to the above cost, under non-perfect competition it will be greater than the cost. Besides this, the third and fourth causes catalogued above are important in a regime of non-perfect competition, especially under monopoly. The concentration of resources in a few undertakings will tend to increase the proportion of indivisible factors and moreover to expand the employment of specific factors, such as technical workers, whose employment is indispensable to the monopolist undertaking. Hence a country where monopolies predominate will present greater obstacles to the equalization of marginal national net products as compared with another wherein oligopolies predominate.

[1] op cit., pp. 144 ff.

The divergence between national net products of one country and another is of interest in so far as it gives a clue to a corresponding divergence between the private and national, as between the national and international net products. Pigou's analysis brings out three main causes as to why the private and the social net products may diverge at their respective margins: (*a*) leasing arrangements, (*b*) uncompensated services to the general public and (*c*) the setting up of psychological reactions. Of these the first is not a useful category for us, while the second one is of direct relevance. As pointed out in ch. iii. mod. B sect. v, the monopolization of exports of a commodity by any country may bring in its wake the development of substitute goods in the importing country as a result of which the terms of trade may possibly turn against the monopolist country as a whole. In this event the monopolization of a single commodity renders disservice to the country as a whole because thereby it has to buy its imports at a higher price. Further it is possible that the countries importing monopolized goods, provided especially that these goods are numerous and essential, may enter into a defensive commercial treaty against the monopolist trader. In such an event the monopolist country stands in danger of injury, that is, its marginal national product is likely to be diminished.

On the contrary a country that imports monopolized goods may not be able to retaliate by the substitution of home goods because it possesses no capacity to develop such goods, that is its total demand for imports is inelastic. Here the monopolist country does not suffer but may stand to gain consequent upon the individual export monopoly. This is an instance wherein the marginal private and marginal national products have either not diverged at all or diverged only to a small extent.

In all cases of non-perfect competition where monopolization or oligopolization brings about a restriction

of output and raising of import prices, the international net product is bound to fall, so that the total welfare from world commerce is harmed. Conversely if the monopoly or oligopoly is expansionist in its policy import prices may fall, setting up a beneficial reaction on the tastes and preferences of consumers in importing countries ; thereby the international net product will be increased. Cases are not uncommon where such expansionist effects have followed the establishment of trade monopolies and oligopolies.

ii

The way is now cleared for a detailed appraisal of welfare under various models of monopolistic, duopolic and oligopolic trade built up and analysed in chapters iii and iv.

Model A of monopolistic trade is obviously the simplest from the point of view of its welfare appraisal. As shown in sect. i of the model, the monopoly gains of England are *PM G*-bale. This gain is unaffected by Germany's ability to produce *E*-bale in small quantities. But it will be affected by the scale of returns in the *E* goods producing industries in England.[1] The gain may, however, be smaller under conditions of diminishing rather than those of increasing (marginal) cost. Further, as was pointed out in the course of the analysis England may encourage customers by not exacting the uttermost farthing,[2] in which case the gains would be lower than those indicated above. Actually the exchange-index will be anywhere between *P* and *Q* which are the limits set by perfect competition and perfect monopoly.[3]

[1] *ante*, pp. 90-1.

[2] Bowley, *Mathematical Groundwork*, p. 25.

[3] This is shown by Edgeworth in his treatment of small import or export taxes, *Papers*, Vol. II, p. 39.

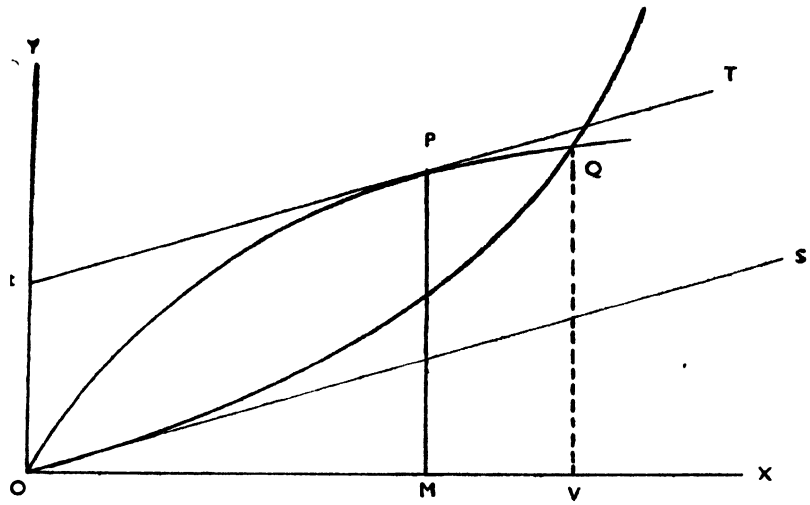


FIGURE 13

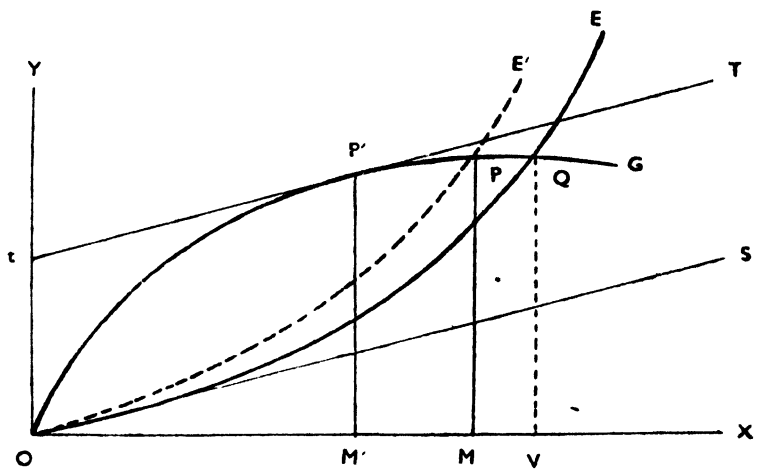


FIGURE 14

Fig. 13 shows that England can earn maximum monopoly revenue of *PR G*-bale which would be reduced if a lenient policy is pursued.

Consider now model B. England is a monopolist of only one of her export products. Her monopoly power is now much less than before. Her *E*-bale curve will be shifted up, but only slightly, so that the movement of the terms will be favourable to her, but it will fall short of the limit of monopoly terms as indicated in Fig. 14. This means German consumers are less worse off than before. Suppose the terms of trade settle at *PM* to *OM G* to *E*-bale. The monopoly limit is *P'M'* to *OM'* bales. It is clear that Germany fares better now than in the former A model, since $OM\text{-}OM' > PM\text{-}PM'$.

Further take into account the substitution effect. So far we had confined ourselves to the shift in the *E*-bale curve owing to the monopolization of a single commodity. Now we have to trace the effects of German consumers substituting home goods for imported goods. These effects will be manifest from shifts in the German *CIC*s. If the consumers are able to cut down imports by the substitution of home goods, there will be a downward shift in the *G*-bale curve, as shown in Fig. 15. Suppose the *G* curve is shifted from *G* to *G'* so as to intersect the upward shift *E'* curve at *P''*. Let the demand elasticities of *E* and *E'* curves and *G* and *G'* curves at their respective equilibrium indices *Q* and *P''* be written as η_e; η'_e and η_g; η'_g. Then the terms of trade will be more favourable to England provided $\eta'_e/\eta_e < \eta'_g/\eta_g$ and inversely for Germany.

From Fig. 15 it will be obvious that whatever the movements of terms, the Anglo-German trade is curtailed in volume after the operation of the substitution effect, not only as compared with perfect competition but with simple monopoly unhindered by the effect. Thus (*OM''* *E*-bale + *P''M''* *G*-bale) < (*OM'* *E*-bale + *P'M'* *G*-bale) < (*OV* *E*-bale + *QV* *G*-bale). The total commercial activity has suffered

because consumers of imported goods in Germany have found it possible to take recourse to home goods, and thereby offset the monopoly power of England. In other words the English exporters of competitive goods have lost a smaller or larger proportion of their export market due indirectly to a single export monopoly, the proportion of loss being dependent upon the magnitude of the effect. Consequently the trading welfare of consumers in England as well as Germany is decreased.

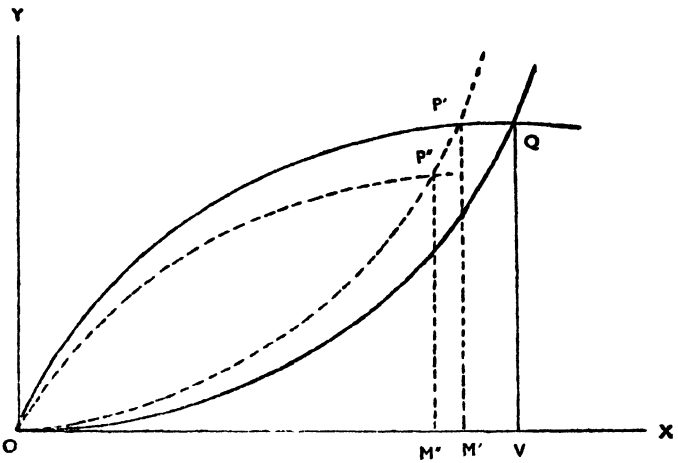


FIGURE 15

We saw above that in respect of one-commodity monopoly as between two countries (England-Germany) the divergence between private and national net products would be measured by the relative rise in export prices of competitive goods as compared to that of the monopolized good. The general rule for such a monopoly is that when the monopolized export good is highly inelastic in demand the national net product will rise, while the international product will fall. In case the demand for the monopolized good is inelastic and the product forms a large part of English

imports the decrease in international net product would be more pronounced. Here world trade as a whole stands to suffer though the monopolist and his country have gained.

Things would be different once Germany started on the path of import substitution, that is, if she had the capacity to retaliate against English export monopoly by manufacturing substitute goods. There is now a lesser presumption that the general level of her import

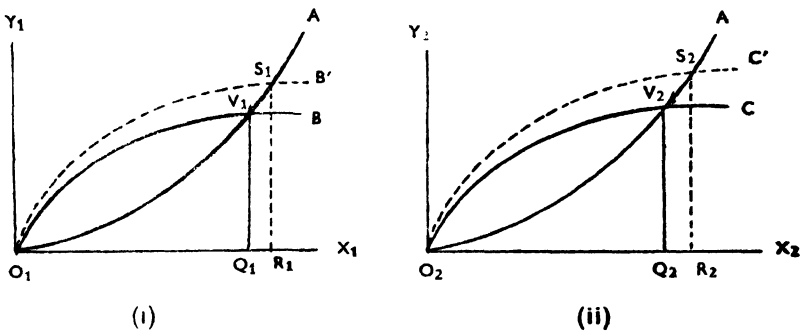


FIGURE 16

prices would rise and keep to a high level for a considerable period even when the monopolistic commodity was in inelastic demand. If the German effect was greater than unity, English import prices would rise more than export prices in which case the trading terms should have turned against England. This means that the private net product in the monopolized industry has increased but the national and international products have fallen. In this case the country and the world have both been worse off because of a single monopoly. On the contrary, should the effect be less than unity, the private and national products may both be increased though the international product would always fall.

In model C we are faced with a single-line monopoly entailing economies of large-scale production. Here one industry is assumed to supply to a many-commodity world. The problem now takes a new shape for we are now concerned with dynamic aspects of industrial and trade expansion.[1] It was shown in mod. B sect. iii that the price of the monopolized commodity would fall below the competitive level provided $\frac{MC_1}{MC_2} < \frac{\eta_2}{\eta_2 - 1}$ for the equilibrium outputs under comparison. The foreign demand for this commodity and other export commodities being assumed to be elastic, its export from the monopolizing country would rise and her whole range of exports expand.

When these provisos are realized the Willingness-To-Trade Curve of countries B and C which are the importers of the monopolized commodity from country A will be raised as shown in Fig. 16 (i) and (ii). The total volume of trade expands and all the trading countries derive benefit from such a monopoly. Thus $(O_1R_1 + R_1S_1) + (O_2R_2 + R_2S_2) > (O_1Q_1 + V_1Q_1) + (O_2Q_2 + V_2Q_2)$ wherein V_1 and V_2 are simple (restrictionist) and S_1, S_2 are expansionist monopoly exchange-indices. The benefit will be greater if the monopolized commodity is an essential raw material embodied in the finished export-goods from B, C and other countries. In any case the private, the national and international net products have all increased. It is of particular interest to note that the country which has smaller elasticity of demand for the monopolized export and which is farther away from the exporting country will benefit to a smaller extent from the fall in the price of the commodity and share less in the resulting gains from trade. This follows from the policy of discrimination which the monopolist exporter is bound to follow in dealing with the individual importing countries.

[1]See ch ii, sect viii for a preliminary discussion of this point

If the provisos stood unrealized, especially if the price of the monopolized commodity were not cut down below the competitive level, there will be a divergence between the three marginal product variations. This would imply economies of large-scale expansion are frustrated and the monopoly power of country *A* is certainly of no benefit but means injury to the trade welfare of the world. The nation may benefit together with the monopolist in accordance with the general elasticity conditions. Under normal conditions of industry and trade it is improbable that the proviso $\frac{MC_1}{MC_2} < \frac{\eta_2}{\eta_2 - 1}$ should not be fulfilled. Hence in real life model C conditions are likely to benefit the monopolist, his country and the trading world. As we shall see below greater advantages are likely to accrue from industrial expansion from the point of view of cyclical fluctuations of industry and trade.

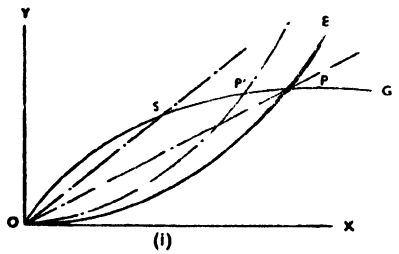
Finally we turn to model D, the last one concerning monopolistic trade. Now all the commodities exported by country *A* are monopolized instead of a single one. This model is, therefore, similar to the first wherein English exports passed into a total monopoly. The main difference is that there are now many instead of only one country which import from *A*. We may first assume that all the industries reap the economies of large-scale industry and in consequence the imports become cheaper within each of the foreign countries. The greater the economies, the larger would be the total volume of world trade not only in the monopolized but in all commodities under normal conditions of (international) demand. Yet there is now a greater scope for the *A* country to discriminate among the exporters because all the exports are monopolized. Hence *A* gains on the whole more than *B*, *C* and other countries. That is to say, the private and national products of *A* will increase more than the international product of *A*, *B* and *C* taken together.

On the contrary, should there be no economies of large-scale industry the import prices tend to rise and imports decline so that the importing countries would stand to suffer from the aggregate power of monopolists in *A*. Those countries which have a less elastic reciprocal demand will suffer relatively more. The import substitution effects in various countries may now come into play. The volume of world trade will contract and the international net product will decline more than under model C. As indicated in mod. D, sect. iii, there now arises a possibility of importing countries entering into trade agreements so as to offset the monopoly power of the country *A*.

Summing up our results for monopolistic trading we find that among various types, monopoly power is greatest and trading welfare of the world at its lowest when only two countries or two parts of world economy are involved and one of them is assumed to monopolize the entire range of its exports. On the other hand the monopoly power is at its lowest and the loss to trading welfare the least when the commodity is one among many exported by a country to numerous countries. Between these two extremes there are many degrees of monopoly power. Further, monopolization is beneficial to world trade when the monopolist can cut down his cost due to expansion of demand and yet finds that the curtailment of marginal cost is proportionately greater than the reduction of demand elasticity. But when this proviso is not fulfilled, monopolization is fraught with harm to the world trade at large. Finally, isolated monopolies are only beneficial to the country as a whole provided they do not turn the terms of trade against the country as a whole through the operation of the import substitution effect in foreign (importing) countries. Should the effect operate adversely there will be an injury to the national dividend of the monopolist country, though there may be a net gain to the individual monopolists.

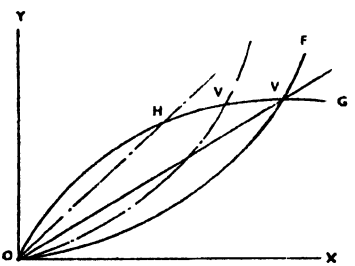
iii

In the world of imperfect competition wherein the behaviour of competing sellers is guided by the reaction estimates of their rival, the problem of welfare



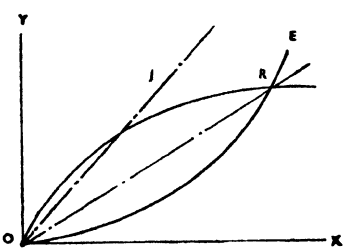
(i)

ENGLAND-GERMANY



(ii)

FRANCE-GERMANY



(iii)

ENGLAND-FRANCE

FIGURE 17

from trade depends upon how these estimates will be actually equilibrated in the foreign markets. The

conditions of stable equilibrium for duopolic and oligopolic trade were set out independently in mod. A, sect. v and mod. B, sect. iii. Once the position of equilibrium is defined, the analysis of gains can be set out by means of the Marhsallian curves. Determinateness and stability of equilibrium are, however difficult to be realized under the actual conditions of duopoly and oligopoly. There will usually be a tract through which the exchange indices of the trading countries oscillate as indicated in sect. vi and sect. iv of mods. A and B respectively.

Let us see how welfare from foreign trade would fare under the duopolic conditions set out in mod. A. Suppose the competitive equilibrium of the Anglo-French-German trade was reached at P, V, R between each two of the three countries as in Fig. 17 (i) (ii) and (iii). Duopolic trading has now set in. Then Anglo-German and Franco-German equilibria will shift, to P' and V' respectively. There is, however, no reason why P' and V' should be stable. The exchange indices may shift back and fro and will be stabilized provided only the equilibrium equation of mod. A is satisfied. The variation of the indices will, however, be restricted within the limits set by pure monopoly and pure competitive equilibria indicated by points S and P, and H and V, see Fig. 17 (i) and (ii). Now these limits will affect Anglo-French trade as illustrated by Fig. 17 (iii) wherein the exchange index is shown at two extremes J and R the former being reached when England and France trade as pure (isolated) monopolists and the latter extreme reached when they trade as pure competitors. Had it not been for Germany, competitive trade between the other two countries would have proceeded by contract and re-contract as in a pure barter situation. The Edgeworthian contract curve would have a longer range of indeterminateness. By implication it is evident that a third competitor trading with duopolists indirectly limits the indeterminateness of their equilibrium.

From the above figures it should be manifest that from the German point of view trade would be more favourable with England and France if her exchange index moved farther away from S and H and came nearer P and V. The nearer the index to the pure competition limit the larger would be the volume of trade between the three countries and the higher the international net product at the margin. Conversely for the monopoly limit. The favourableness of German foreign trade is also subject to the demand elasticities in respect of Anglo-French trade *inter se*.

From the point of view of English and French duopolists trade will be favourable when the foreign demand for their goods is highly inelastic, that is, competition from the rival is feeble and fear of commodity substitution is least. Whichever country's trade comes under this proviso will command a larger private and national net product, but will contribute less to the international net product.

Consider now the oligopolic trade mod. B. The number of sellers and the varieties they brought to the export market have become numerous. The problem of reactional behaviour still persists, but the reaction coefficients will now in all probability be smaller and the path of adjustment steeper than in the previous model. The range of indeterminateness of equilibrium will thereafter be smaller, as seen in Fig. 18 (i), (ii) and (iii). The exchange index of countries A and M, B and M and C and M will vary within a smaller range R_1, P_1, R_2, P_2 and R_3, P_3 where R_1 and P_1 etc. indicate the limits of monopolistic and competitive trading in each country.

Since the area of trading has now widened and the commodities exported from the oligopolic countries have substitutes, the presumption is that the (Marshallian) elasticity of demand of M for imports from all the other countries *inter se* is considerably high—in the neighbourhood of unity. The volume of world trade will approach closer to the competitive

norm than under duopolic trading. The prices of oligopolic products will approximate nearer to the competitive prices. This gives rise to a new feature,

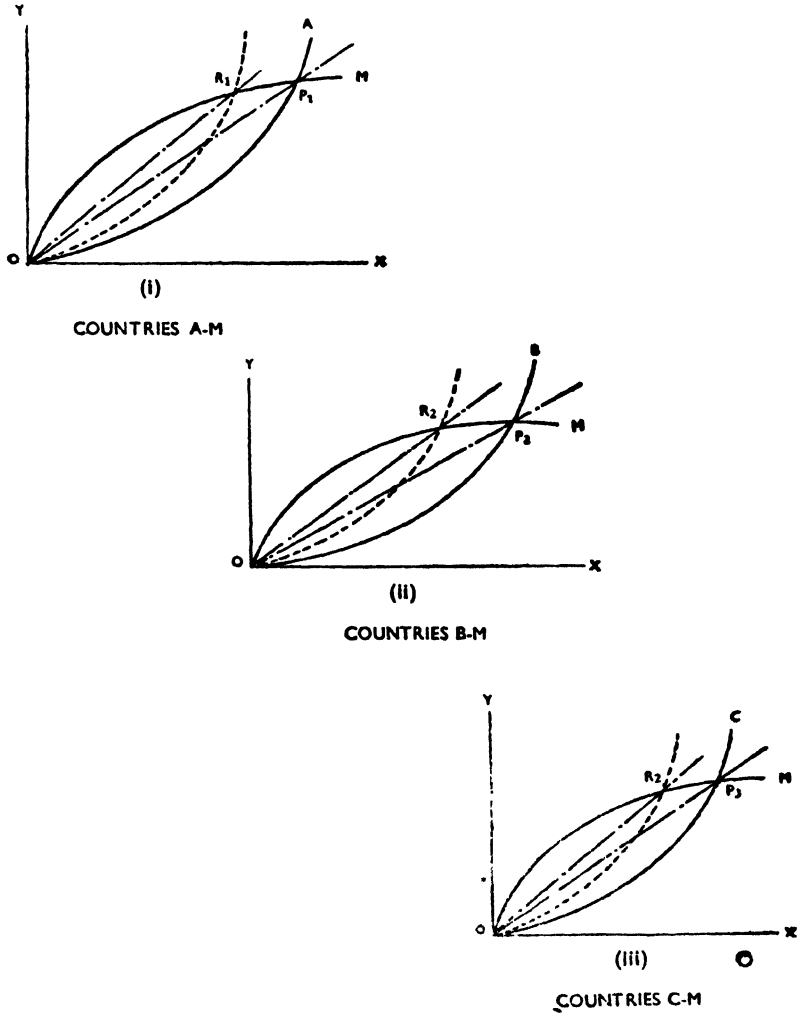


FIGURE 18

characteristic of the model B. The sellers will be induced to spend on advertising and direct selling

in order to combat price rigidities. We have already analysed in both mods. A and B the effects of advertising on the equilibrium of each composite commodity group. Here we are concerned with the effects of advertising on the trading situation as a whole. We must now keep it in mind that when selling campaigns become competitive they cannot yield any net gain to the sellers in the shape of larger revenue,[1] unless however, the tastes and preferences of consumers were altered by the campaigns thereby adding to the incomes of all or most of the sellers engaged in such campaigns. This reservation, however, introduces a dynamic element into the analysis since it must involve a change in the proportion of national dividend in each importing country which is devoted to current consumption.[2] Within the framework of static analysis, competitive salesmanship will not affect the gains-from-trade for the exporting (oligopolic) countries considered as a whole. The volume of world trade under oligopoly with selling costs is, therefore, likely to remain much the same as under oligopoly without selling costs.

Since the advertising and direct selling outlays are, under static conditions, not conducive to a net increase in world trade, it is evident that from the point of view of the world as a whole, they are a net loss reducing the size of international net product marginally considered. Under dynamic conditions, however, consumers may be taught new uses of old varieties or else their pattern of tastes and preferences could be changed.

Finally it remains to examine mod. C wherein we sought to analyse the problems of trade under cartellization. It was pointed out that international cartels are the outcome of industrial fluctuations. Because of the inherent difficulties of the problem, no definite conclusions could be set out as to the effects

[1] Pigou, *Economics of Welfare* (4th ed) p. 199.

[2] There is also the problem of uncertainty as to the (future) effects of aggregate expenditure on selling effort on the propensity to consume the entire commodity.

of prices and volumes of cartellized products on the entire trading framework of participating countries. It was, however, seen that the prices would fluctuate much less in a cartellized industry but the restriction of output would tend to be greater because of the efforts of cartel-members to maintain a high level of profit. As a rule the marginal private net product in a cartel industry will rise while the national net product may either fall owing to the import substitution effect or else rise but not as much as the private net product. It is however possible to increase the national as also the international net products relatively more than the private net product provided the cartels are expansionist and non-discriminatory in their price output policies. As we saw in ch. iv. mod. C a few cartels pursue such policies and to that extent they cannot be considered as inimical to the aggregate of welfare from world trade. But as a rule cartels are restrictionist and hence their welfare effects are on the whole injurious.

iv

From the serial appraisal of individual models we now proceed to discuss the methods of welfare maximization under regimes of monopolistic and oligopolic trade. Let us first recapitulate the principal points on which the two regimes differ. The monopolistic seller enjoys an undisputed control over his market and as such possesses a greater potentiality of inflicting harm on the consumers by curtailing output and charging high prices. On the other hand, the oligopolist finds his market control weakened because he has to reckon with the price policies of his competitors. Since the rival price-output reactions cannot be accurately predicted the oligopolist regime is subject to price-output instability from which the monopolist one is safeguarded because of closed entry into his industry and larger excess capacity of the firm. Secondly, the monopolist has no need to resort to intensive advertising and direct selling as the oligo-

polist sellers do with the dual object of maintaining and pushing up their sales. It follows that expenses on competitive advertising are saved in a regime of monopoly. Yet this feature implies that the buyer of monopoly goods cannot enjoy the luxury of variety of products and catering to his tastes as he would do in a regime of oligopoly. In the latter the sellers will be induced to develop new uses of their own products and put new patterns on the market in order to maintain and expand their individual sales. There is likely to be a larger 'mass of commodities' though not necessarily a greater 'sum of satisfactions' under oligopolic rather than monopolistic trading.

The contours of world trade of our times are rapidly shifting from the norms of perfect competition, as indicated in the introduction, sect. vii. Monopolies and oligopolies predominate in different measures. The question we have now to answer is this : In what manner is aggregate welfare from world trade, as indicated by the international net product of traded resources, *likely* to be maximized in a world economy honeycombed by monopolies and oligopolies ?

Export monopolies are capable of injuring welfare in two ways. First, they may force the foreign countries to pay higher prices on their imports. Secondly they may entail the import substitution effect whereby the entire export trade of a country may be harmed. In both ways the international net product will be depressed. But the second way is not of immediate interest, for it is concerned with a particular country which can protect its national welfare from the monopolist self-interest by taxing his income and redistributing the proceeds among those who have been injured. It is the first way, that is the injury to the aggregate welfare of the world as a whole with which we are at present concerned. In this connexion it should be noticed that the more essential the products monopolized by the export traders of a country the greater would be the potential harm to the commercial welfare of the world. Discussing the incidence of

import and export taxes levied by newly developed countries Marshall observed: 'Acting concurrently, whether by mutual agreement or not, they might be in the possession of an unassailable monopoly; and any taxes, however oppressive which they might impose on the products which densely peopled countries offer to them, would then be paid mainly by those countries.'[1] There are only a few countries however, which possess such export monopolies. The principal cases of such monopolies are in respect of raw materials, and the monopoly power is even then limited by the development of substitutes and unutilized resources in countries. The growth of commerce and industry is already reducing such monopoly power and the consequent harm to international net product. The real source of harm to the latter lies in international cartels and schemes of raw material control.

In industries where the technical requirements demand a large-sized plant and the assurance of a large market, welfare is likely to be enhanced by singleness of control and/or unified sales policy. Monopolies and cartels are desirable in such cases provided they are operated for international benefit, that is, they are fair in prices and expansionist in their output policies. It would, therefore, be unwise to resort to wholesale 'trust-busting'. Some cartels require international control. The most obvious cases of these are iron, steel, rubber, industrial chemicals and such other 'strategic' raw materials for a peace economy. Apart from any direct control two methods of fiscal policy are desirable: subsidies based on the proportionate share of import demand may be given by different countries with the object of expanding such industries. Next import duties may be imposed *collectively* by all countries if cartels resort to restriction of output. These measures are practicable only when the chief importing countries are united in their policy to foster world trade and prevent

[1] *Money, Credit and Commerce*, p. 202

the self-interest of monopolies and cartels from reducing the aggregate welfare from world trade.

The beneficial effects of international control of monopolies and cartels should be manifest. Prices would be fair and quotas to different countries, in case the quota system were at all retained, regulated on a liberal scale. Buffer stocks would be maintained in monopolized and cartellized industries and thereby fluctuations in prices forestalled. Since there would be no fear in any importing country of supplies of materials being curtailed or cut off a decisive incentive for the production of expensive substitutes would be removed. One essential limitation of such control should, however, be noted. It cannot ensure a steady level of effective demand especially for raw materials which are largely influenced by booms and depressions. Unless these are effectively brought under check by national policies there can be no guarantee that the expansionist policy of cartels would, by itself, increase the international net product.

V

Next we proceed to the question of oligopolies so as to find out how international net product can be maximized when the traded products are differentiated.

The industrial development of agricultural and raw-material producing countries will increasingly emphasize oligopolic competition between home-produced and imported goods. Under these conditions the national dividend will rise because of greater employment provided in the newly developed industries. But as a result of the narrowing in the comparative cost ratios there will be a shrinkage in the volume of world trade.[1] The ensuing fall in the international net product may however be counterbalanced by a greater mass of differentiated products for varied tastes.

[1] D. H. Robertson, 'The Future of International Trade' *E.J.* Vol XLVIII (1938).

In an oligopolic situation the international net product is likely to be reduced in any of the following ways: (i) The oligopolists may be led into price-warfare due to the failure to reach a stable equilibrium. This would be more so if the group of competitors is small. The consumers would suffer owing to uncertainties of price policies. This possibility arises especially in cut-throat competition. (ii) On the other hand, there may be rigidity of prices when the group is dominated by a leader or all competitors have to maintain institutionalized prices. Hence the consumers may not have the benefit of price-reduction even if the market forces warrant this. (iii) The competing sellers may be led into advertising and direct selling which does not expand the aggregate sales but only redistributes them among their competitors so that the outlays are socially wasteful. (iv) Finally, the existence of a number of competing sellers in an industry may be detrimental to collective welfare because the industry can be profitably organized with a large plant and under single control.

Since oligopolic sellers of any 'commodity-type' would be spread over different countries international control could be hardly feasible as in the case of monopolies and cartels which are, by their very nature, centralized. The measures whereby international net product can be maximized need in this case be adopted by each country. Let us now catalogue them. In the first place, the control of oligopolic prices needs to be instituted when the public authority is satisfied that they reach a rigid level appropriate to monopolist concerns. Secondly, hindrances to the entry of resources should be removed from those undertakings in which free competition rather than monopolistic control is desirable. This will prevent the oligopolic group from being too small. An important means of breaking down this hindrance is the encouragement of technical research and easy grant of new patents, so as to foster the growth of free competition. Thirdly, socially wasteful advertising should be discouraged by

the levy of income taxes on rival firms which advertise their products although their individual market is established and their products can hardly be put to newer uses. Finally, the amalgamation of rival firms into a single monopoly may be promoted and competition discouraged in industries wherein product differentiation is socially undesirable. The last method ought to be adopted only when the state authority is convinced after a careful investigation that the establishment of monopoly is a social gain.

From a comparison of the preceding and the present section it must be clear that the international control of trade monopoly is a matter which is comparatively simpler than the national regulation of oligopolies. In the latter the state authority will be called upon to judge issues, such as what constitutes fair and flexible prices, or when advertising is socially gainful and when wasteful, for which no definite objective tests are available. Under such conditions the authority will have to rely in the main on its discretion. The control of trade monopolies and cartels, though free from risk of discretionary judgement is, however, beset by another difficulty. Not only a few private interests but the entire national self-interest is often bound up with the maintenance of restrictionist export monopoly or with that of an international cartel. In the latter not one but a few countries may be interested in restrictionism. There is a clash between national and international welfare in such cases, and the latter cannot be ensured without the existence of the over-riding authority of an International Organization. Is such an organization probable in the present day world —or rather the world of tomorrow? Here we have to stop, for beyond this lies the territory of historical speculation.

vi

The critical comparison of our trade models in sects. iii and iv and the general commentary of the last section postulated that the welfare of persons depends upon prices and volume of goods entering

into foreign trade. No account was taken of internal trade in the welfare appraisal. Let us bring this into the last stage of our commentary and notice the difference it makes to the conclusions we have reached.

The size of the national dividend of a country which determines the aggregate welfare of persons living in it is made up of goods produced and exchanged within a country together with those which are produced abroad and imported in exchange for the goods exported from the country. The former constitute the volume of internal and the latter of foreign trade. Our reasoning in the foregoing sections assumes that changes in the aggregate welfare of persons in a country as also of those in the whole world are in the same direction and of the same magnitude as changes in the welfare due to international trade. From the point of view of aggregate welfare of a country and the world a marginal increase (or decrease) in the net product from internal trade is identical with that in the net product from foreign trade. Now the question is, how far is this assumption legitimate ?

Edgeworth's familiar dictum about changes in the exchange-index being indicative of rearrangements of internal trade gives us the initial clue. So long as there is perfect competition any shift in the exchange-index of foreign trade sets up consequential shifts, of equal magnitude and in the same direction, in the prices and volume of internal trade. It follows that, under perfect competition, changes in the national dividend derived from foreign trade will be precisely balanced by corresponding changes in the dividend from internal trade. But once we get away from the ideal conditions of perfect competition this identity of effects cannot be vouchsafed. The advent of monopoly and oligopoly must cause disturbances in the exchange-index which would work themselves out in the secondary phase in the prices and outputs of competitive export goods. These disturbances will also spread to the producers of home-market goods, the effects of which we shall now investigate.

Suppose, first, that the terms of trade have risen, that is the import prices have increased more than the export prices and the volume of exports declined. The rewards of factors and their aggregate employment in the monopolist and oligopolist concerns will now fall. Their effective demand for imported and home-produced goods is affected and their consumption will be reduced. True, the monopolists and oligopolists whose profits are now swollen might spend them on home-produced goods. It is, however, not probable that the whole of such profits would be so spent. It is likely that the major portion would be reinvested in old or new industries. The expansion of employment so provided may compensate for the decline in the demand for home goods. There may, however, be a time-lag between the earning of monopoly profits and their investment into old or new industries.

Next suppose that the terms of trade have fallen and the volume of exports increased. The monopolist has now expanded his industry and the volume of employment has risen, although the factor rewards may still fall short of the perfectly competitive level. Since the import prices have fallen and the incomes of export producers and their employed factors increased, there will be a rise in the consumption of imported as well as home-produced goods. The producers of the latter will be induced to augment their outputs.

The effects on the home industries of a rise or fall of exports can be more accurately analysed by means of foreign trade multiplier.[1] Let E stand for value of exports, and i for the proportion of total income from imported goods. Then the aggregate income from internal trade is $\left(\frac{I}{i} E - E\right)$. Assume this aggregate income to be $\frac{E_1}{i_1} - E_1$ and $\frac{E_2}{i_2} - E_2$ before and after the advent of monopolies as also oligopolies. If terms

[1] Full exposition of the concept is to be found in Harrod, *International Economics*, pp. 122 ff.

of trade rise E_2 would normally fall below E_1, the income of home-producers would then be reduced provided $\frac{E_1}{E_2} < \frac{i_1}{i_2}$, that is the total volume of exports has fallen relatively less than the multiplier. On the contrary, if the exports expand, E_2 being normally greater than E_1, the total incomes of home producers will increase provided $\frac{E_1}{E_2} > \frac{i_1}{i_2}$, which means that the increase in total value of exports has risen more than the multiplier. The answer to the question whether the rise or fall of terms and volume of trade will reduce or increase the incomes and hence the welfare from foreign trade depends upon the above conditions.

When there is a contraction of exports the curtailment of employment in the export industries is not likely to be considerable unless the merchants expect the trend to persist and depression to set in. Some curtailment is, however, bound to come about and this will result in the wage-earners retrenching their purchases of imported goods. The retrenchment will be pronounced the more elastic is the demand for foreign goods and the easier it is to substitute home goods for them. When there are no prospects of depression and where the demand for imports is elastic the multiplier will fall more than the value of export trade and the incomes of home producers will be depleted. Turning to the expansion of exports we may extend the above reasoning and conclude that under normal business and high demand elasticity the producers will increase their output and volume of employment more than the purchases of imported products by the wage-earners, and the incomes of producers will tend to be augmented.

Subject to the foregoing reservations it is, therefore, valid to assume, as we have in the earlier sections,

that an increase or decrease of the national as well as the international net product is in consonance with that in the national net product, all these products being considered at their respective margins. The private interests of the producers of home goods are, under normal conditions, in harmony with those of the export producers. Both classes can gain from trade from an expansion in the volume of international trade. And, what is more essential, the world interests at large can best be served if the internal and foreign traders pursue such an expansionist policy.

CHAPTER VI

TRANSITION TO A TRADING WORLD OF UNCERTAINTY

THROUGHOUT the analysis of international trade under monopoly and imperfect competition attempted in the preceding chapters, we have postulated a trading world wherein commodities are exchanged under conditions free from the complications of money and capital. In order to keep out the disturbances caused by monetary exchange rates, we utilized Yntema's device 'fixed-height schedules' which slid upwards and downwards in perfect harmony with the corresponding shifts in demand for traded goods. This device enabled us to concentrate on the specific effects of market imperfection on trade relationships. In a similar way we excluded from our analysis the capital market so as to leave out of account the complications arising from waiting and uncertainty in imperfect commodity markets.

There are, however, certain defects in this approach. In the first place our analysis introduces money into the trade relationships merely as a *numeraire* and purports to keep them within the bounds of static equilibrium. This procedure goes back to J. S. Mill who regarded money as an instrument of exchange, maintaining that 'the substitution of money for barter makes no difference in exports and imports, nor in the law of international values'. Now the purpose of the (competitive) barter analysis of the classicists was to probe beneath the surface of money prices and exchange rates to the underlying forces of demand playing upon employable resources. Yet so long as they were concerned with trading equilibrium, money was not only irrelevant, it was inconsistent. For 'since certain foresight is assumed under static equilibrium,

money and static equilibrium are incompatible'.[1] Money in its real sense can be introduced only when the analysis of product prices and factor prices is dynamic. As we shall see below the theory of price conjectures which we explored in chapter iv requires a dynamic monetary analysis. In like manner the exchange rate which links up the traders of one country with those of another involves their price and profit expectations which are also dynamic in character.

Secondly, the exclusion of time from our analysis has meant the exclusion of capital, for time is the essence of the theory of capital. Increasing returns arising from the economies of large-scale industry operate through time and it is not legitimate to treat them within the framework of static analysis.[2] The modern trend towards market control is the result of the concentration of resources in the hands of a few firms. Capital movements from one country to another, especially those which are long-term, bring about important changes in the structure of production and thereby the terms of trade. These movements must, therefore, be considered for an adequate understanding of imperfect competition in the realm of foreign trade.

The following sections attempt to repair these defects. We shall first consider the adequacy of the Purchasing Power Parity device of 'fixed-height schedules' and then proceed to the dynamic complications introduced by money into our analysis of trade relations under imperfect competition. Next we propose to take up international capital movements and investigate their effects on our monopolistic and oligopolic trade. At the last stage we shall examine quantitative trade restrictions and exchange control so as to appraise effects on expectations and uncertainty in international trade. Our treatment of

[1] P N Rosenstein-Rodan, 'Co-ordination of the General Theories of Money and Price' *Econ N S* Vol III (1936), p 272

[2] Kaldor has sought to show that 'the Senior-Jevons-Bohm-Bawerkian law of roundaboutness is merely a roundabout way of expressing the law of non-proportional returns' *Economet.* Vol V (1937), p. 231

these issues will be discursive for these are, for the present study, border line issues and their exhaustive investigation is outside its scope.

i

In chapter iii, mod. B, sect. iii it was assumed that 'changes in monetary conditions shift all the demand and supply schedules of a country upwards or downwards by some ratio which is the same for all countries'.[1] For instance, in regard to a commodity k selling in a country p at a price y_{pk} measured from a base y_{pk}, the change in monetary condition in p would be $r_p = \frac{Y_{pk}}{y_{pk}}$ $(k = a, b, c \ldots n)$. If the changes in monetary conditions in the importing country as related to the exporting country were multiplied by the exchange ratio of the latter to the former, we shall have the Net Monetary Factor. Thus r_p and r_g are the changes in monetary conditions in p and g countries and $C\frac{g}{p}$ is the exchange ratio. Then the net monetary factor is $Z\frac{g}{p} \equiv \frac{r_g}{r_p} C\frac{g}{p}$ which is deduced to be equal to unity in the absence of any disturbances operating on demand and supply of internationally traded goods. If $Z\frac{g}{p} = 1$ it is to be regarded as an indication of a real or uncompensated shift in the heights of 'fixed-height schedules' and hence in the net monetary factor.[2] This condition implies that 'the rate of exchange is determined by the purchasing power possessed by a unit of each kind of money ; it must be determined at such a level that it makes no difference whether commodities are directly exchanged with one kind of money or indirectly through money of the other kind'.[3]

[1] Yntema, op cit , p 10

[2] op cit , pp 12, 17-18

[3] Pigou 'The Foreign Exchanges' *O J E* Vol XXXVII (1923), pp. 64-5

Two weighty objections have been urged against this theory. In the first place it is pointed out that the changes in price-levels (i.e. r_p and r_g) which according to the theory are reflected in the movement of exchange rates do not spread to all the commodities produced in the trading countries. Hence internal purchasing power need not be so related to the external purchasing power as to be inversely proportional to the exchange rates. It is argued that the doctrine applies only to internationally traded goods—the *A* class of Harrod. Secondly, it is maintained that foreign currencies are demanded by individuals for the purchase of foreign goods *not in general*, as maintained by Cassel, but for particular goods whose price-changes cannot be measured by a statistical average represented by a price-level.[1] The second objection is in reality against 'the collective concept of the demand for money',[2] and is opposed to the general price-index for explaining changes in purchasing power.

Both the objections raise difficulties which need to be examined. In the first place though this doctrine is concerned only with internationally traded goods, it assumes implicitly that any changes in the external value of a currency is accompanied by corresponding readjustment in its internal value so that the latter does not act as disturbance on the consequential changes in the exchange rate arising from the former. In chapter ii, sect. iii we discussed how the 'rearrangements of internal trade' referred to by Edgeworth could be taken, under conditions of perfect competition, to synchronize with changes in the exchange-index. It is true that under monopoly and oligopoly this synchronous movement between the two does not operate because of substitution between home goods and imported goods which disturbs the simple mechanism of perfect competition. But this difficulty

[1]See Ohlin, *Inter-regional and International Trade*. op. cit, ch. xxv Ellsworth *International Economics*, p 253

[2]Wieser has expressed himself against employing this concept for explaining changes in the value of money Mises, *Theory of Money and Credit*, p 136, has answered this objection

arises because we introduced into our imperfect competition analysis, the problem of commodity substitution. If we assume either that there are fixed price-ratios between imported and home-made goods, or else they are independent goods the doctrine can be salvaged from the above difficulty. But as we shall see presently we have no justification in fencing off the doctrine behind the proviso stipulated above.

The second objection regarding 'collective demand for money' is more readily answered. Doubtless money is demanded by individuals for independent transactions at home and abroad. Yet the total demand for money comes from all individuals requiring money not only for transactions against commodities but for all purposes such as 'to pay taxes, to transfer borrowed capital and pay interest and to make presents'.[1] Foreign currency is demanded for foreign exchange requirements as regards the purchase or sale of goods in the present or in the future. The price-changes in respect of all goods exchanged during a particular time-interval can be measured by an indexed average provided proper care is taken in its computation.[2]

ii

The real weakness of the Purchasing Power Parity doctrine is to be found in the traditional theory of money on which it is based and which does not properly allow for the 'cash balance' function. In foreign trade as in domestic trade money 'exists only and in so far as general foresight is not certain ; it is a function of the individual's feeling of uncertainty'.[3] Expectations play a vital role in the behaviour of the consumer of foreign goods and the market policy of importers and exporters. All these are concerned with the probable movement of prices of traded goods in the *future*, or, more precisely, different points of time in the

[1]Mises, op. cit , p 137.

[2]See *ante*, ch. II sect. ii for the treatment of the index-number problem

[3]Rosenstein-Rodan, op. cit. *Econ. N S* Vol. III (1936) p 272.

future. Consumers distribute their incomes on home-produced goods and imported goods on the basis of prices ruling at the time and those which are expected to rule in future. On the other hand, importers and exporters plan their purchases and sales in accordance with their present as well as expected prices at home and abroad on the basis of current and expected rates of exchange Price-expectations of the latter are functionally dependent upon the exchange rate expectations. Thus if prices of imported goods are falling, the importers and exporters anticipate that their foreign exchange may be devalued by deliberate state action or depreciate by capital movements or such other 'natural' causes. They may balance both the expectations; and provided the exchange devaluation or depreciation is believed to offset the falling trend in prices, the importers will import less goods and exporters export more goods.

Under modern conditions of managed currencies wherein foreign exchanges are stabilized by means of the Exchange Equalization Accounts the purchasing power pars are taken more or less to be certain. There is not much room for expectational variations so far as the exchange rate is concerned. The revision of static analysis under such stable conditions is less complex. We are faced with only one type of expectations—those which the consumers, importers and exporters all entertain in respect of current and future levels of prices as expressed in domestic currency.

iii

Let us now discuss how the working of money as 'a subtle device for the linking of present to the future' will affect our analysis of monopolistic and oligopolistic trading in chs. iii and iv. We have now stepped into a world of uncertainty wherein, as pointed out above, the demand for goods is a function of prices at different time-intervals, p_{t1}, p_{t2}, p_{t3} .... The equilibrium that obtains under such conditions is a shifting or

dynamic one so that 'there is no definite point towards which the system tends'.[1] Here we have a system in which the changing views about the future are capable of influencing the present situation.[2] The expectations of consumers and of producers will be liable to disappointment and, because of this, subject to periodical revision. This dynamic change makes our analysis of price-conjectures (ch. iv, mods. A and B) unreal. Since there will be no necessary correctness of conjectures the equilibria of oligopolistic markets will be rendered highly unstable. Even the monopolistic equilibrium will become unstable. For though he might be sure of no new producer forcing entry into the industry, yet the monopolist would have to reckon with the possibility of rival substitutes being developed in the near future and thus breaking down his monopoly.[3] The expectational complex of the monopolist and his clients is, however, different from that of the oligopolists and their clients. The former is characterized by a greater confidence of prices continuing to remain unchanged through time.[4] Both of them will, however, try to insure themselves against uncertainties of the future. The producers will keep excess capacity to meet unforeseen increase in demand for their product, and the buyers (as well as sellers) will reserve an unspent margin of their incomes for unforeseen changes in prices (commodity prices as well as factor prices). The total supply of these unspent margins will constitute the savings of the community for the particular period. The major part of these savings will be normally turned into investments for different durations, the remainder

[1] Rosenstein-Rodan, op cit, p 275

[2] Keynes, *General Theory of Employment and Money*, p 293.

[3] This possibility will mainly arise in respect of short term conditional monopolies

[4] It is however probable that prices in oligopolist markets, at least many of them, may be rigid owing to price-leadership In such cases the degree of confidence of buyers in the continuance of these prices will naturally be greater But the oligopolists cannot be equally confident that new sellers may not enter into the group or that some of the existing sellers may not successfully overcome the rigidity of prices by advertising or direct selling.

being held in 'cash', that is, liquid resources. The ratio of the 'cash' to total savings will depend upon the absolute size of individual incomes and the individual's price-expectations in the period concerned.

Let us now see how the main variables in the dynamic system are inter-connected. We may start from an initial position wherein the values of exports and imports are in equilibrium. I_f is the income of export traders from the exports of consumption goods during the particular period, I_h the incomes of internal traders from home-made consumption goods. Then I, the total income of the country, will be equal to $I_f + I_h$, all capital assets inherited from the previous periods or made during the particular period being excluded from the analysis. r is the ratio of I which the persons in the country set aside as savings for investment of the next period. Lastly, V and Q are the respective quantities of home-made goods and imports, the latter obtained by the sale of exports during the period with S and P as the respective price-levels of these goods. We shall then have:

$$I_{(1-r)} = PQ + SV,^1$$

which is the same as

$$(I_f + I_h)_{(1-r)} = PQ + SV.$$

Consider first the effects of a fall in the terms of trade so that the quantity of imports is reduced. I_f has fallen and so has PQ. The consumers of imported goods and the producers of exported ones will be induced to cut down their savings, that is, I_f and r will fall and the fall in r will be marked when the unfavourable trend is expected to continue. The volume of employment in export industries will now tend to be curtailed. The supply of savings having fallen, the rate at which capital is being invested will be raised, that is the marginal productivity of capital will increase. Now the monopolist exporters are relatively in a secure position in that they can draw upon their reserve stocks and excess capacity. The well-en-

[1]We have here followed Lindahl's equation in *Studies in the Theory of Money and Capital*, p. 142

trenched oligopolists will also do this but such of them as do not have much excess capacity are liable to incur losses. The position of internal traders will be similarly affected by these changes. The prices and outputs of these traders will have to be adjusted to the new levels reached in export monopolies and oligopolies during the period under analysis. At the beginning of the next period the relation between home prices and import-export prices, that is, between S and P will be governed by the changes in the other variables I, r, V, Q, the ratio between S_1 and P_1 of the first period will most probably be unequal to the corresponding ratio between S_2 and P_2 of the second period. The exchange rate between the particular and any other country may, however, be out of step with the change, for the exchange rate is a link between the price-levels and imports-exports. The purchasing powers of the two currencies will then be altered out of proportion with the levels of home-made and traded goods.

Turn next to the effects of a rise in the terms accompanied by an expansion of the volume of trade. These are the reverse of the above effects ; I_f and r will tend to rise and a larger supply of savings will now seek investment. The monopolists and oligopolists will now be persuaded to expand their undertakings, provided the prospective rate of return is higher than the present rate of interest charged on (current) investment. Since, however, there is already some excess capacity at their disposal, they will be more cautious in increasing the size of their plants and thereby enlarging the excess capacity for the future. The monopolists' decisions will be influenced by long-run considerations as they have to work on the basis of longer production plans. The consequential effects on internal traders will be on the same lines as before. The cumulative disturbances of the first period will shift the purchasing power pars of the trading countries out of proportion with home-market and foreign market price-levels.

With the introduction of money the effects of changes in terms of volume of trade tend to be cumulative. There is no warrant that they will be equilibrated in a stable manner from one period to another. The main disturbance on the stability of the system is to be found in the capital market. At the beginning of any period there exist capital assets created in the past and required to be maintained intact while, during the period, new capital assets are being created. Current supply of savings may not equilibrate with the demand for new investments. The determinates of monetary equilibrium will be these: (i) current and expected commodity prices, (ii) volume of current income, (iii) the supply of savings which is a ratio of (ii), and finally, (iv) the demand for savings from producers willing to canalize (iii) into fresh investments. In non-perfect as contrasted with perfect competition all these determinates will be subject to the frictions due to the sellers, control on commodity and factor markets and closed entry into their occupations. There cannot be any control on savings and investment. Nevertheless any variation in savings will fail to be adjusted freely with a corresponding variation in investment and the monetary equilibrium will be rendered indeterminate as well as unstable.

iv

At this stage we shall bring international transfers of capital into the picture and notice how they affect our equilibrium analysis. The effects of capital were already considered in the last section. Since money and capital are inseparable their analysis cannot be isolated without obscuring the real issues which arise from them.

Classical thought on the subject was confined mainly to the effects of capital movements on product prices and factor prices and through these on the movement

of goods and services.[1] On the other hand recent thought 'finds the *causa efficiens* in the transfer mechanism to be *the very transmission of buying power* and its influence on demand'. It is, however, not our object to examine the *mechanism* of transfer in a regime of non-perfect competition. We are primarily concerned to trace the *effects* of capital transfers on the course of trade under this regime.

In spite of considerable divergence in the precise definition of the concept, there is agreement that capital goods embody waiting. These goods are produced and are non-permanent in the sense that they do not belong to the natural environment of man whose resources are capable of being depreciated and again replenished by itself unaided by man. Now the supply of non-permanent resources yields a flow of utilities termed as income and capital is created for the purpose of yielding a permanent income-stream through time. Now if human foresight were perfectly certain, the supply of capital for investible funds and capital goods for different time-intervals should have been infinitely elastic and the rates of interest, the supply price of capital should be determined by different rates of productivity of capitalist process. But since foresight is uncertain there arise different rates of time-preference. It is for this reason that 'considerable capital is always made up of a combination, in varying proportions, of two factors, namely, waiting and uncertainty-bearing'.[2] The capital market links up the supply of investment with its demand by means of various money rates of interest which act as levers on expectations of capital savers and producers ranging over different periods of time. The international movements of capital are caused by differences of

[1]As regards the difference between the classical and modern approach Iversen observes 'the doctrine which Mill's authority made "classical" postulates permanent shift in the relative price-levels of the two countries (for commodities in general, including international goods) in favour of the borrowing country as *a necessary part of the transfer mechanism*, whereas the "modern" theory first expounded by Bastable denies the necessity of this turn in the barter terms of trade', *International Capital Movements*, p 208 (Author's italics).

[2]*Economics of Welfare* (3rd ed), p. 163.

interest rates as between one country and another. Capital transfers are made in order to profit by these interest differentials, and as a consequence of the transfers the different rates tend to attain a parity, due allowance being made for the cost of movement.

In analysing the effects of movements there arises a distinction between short-term and long-term capital. 'The distinction refers to the intention of the investor, not to the form of investments.' In the former 'foreign securities are sold with the intent of buying them back when the rate of interest drops'.[1] In the latter there is a renewal of loans year after year so that they are a relatively permanent investment. The main point to remember is this, the short-term loans are temporary flows of capital mainly caused by disturbances in balance of payments. On the other hand the long-term loans are permanent flows that affect the structure of production in the borrowing and lending countries and thus set up consequential disturbances in the balance of payments. We shall be mainly concerned with the long-term effects, for it is these which are essential from the point of view of dynamic analysis.

First consider the transfer of *investible funds* from, let us say, country *A* to country *B*. The former finds the supply of credit reduced and the home industries as well as export industries are now faced with a credit stringency. Since the rate of interest rises, the industrialists will adopt less capitalistic methods and substitute capital by labour. Investments will be checked and excess capacity will tend to be used up. The balance of payments will now shift against *A* and in favour of *B* and under flexible exchanges *A*'s exchange rate will appreciate. Simultaneously *B*'s supply of capital is increased and this will react on its internal interest rates which will now tend to be depressed. *B*'s home and export industries will be induced to invest in fresh undertakings and to expand the old ones. *A*'s balance

[1] Iversen, op cit., p 29 Also Karin Kock, *A Study of Interest Rates*, p 92

of payments will turn in its favour causing a disturbance in the terms and volume of trade. The main thing to remember is that the transfer of buying power from *A* to *B* is one of liquid resources which can be distributed in any way that persons in *B* prefer and for any duration that they choose. They can utilize the power on the purchase of capital or consumers goods from *A* or any other foreign country, or else similar purchase within the country itself. The effects of such transfer are diffused through the economic system from the initial stage. The monopolist and oligopolist undertakings both in *A* and *B* will be affected in the same manner as when in *A*'s case the trading terms rose and in *B*'s case they fell.

Next take up the transfer of *capital goods* from country *A* to country *B*. This will immediately affect the structure of production in either country. The capital intensity in *A* is decreased and that in *B* increased. Since the capital goods are specialized, changes in the intensity will be confined to those industries wherein the goods are necessary. This stands in contrast to the movement of liquid funds whose effects tend to be generalized. The transfer would disturb the balance of trade between the two countries tending to be shifted in *A*'s and against *B*'s favour and this will immediately affect the terms of trade, while in the former case wherein the transfer consisted of funds there was no immediate disturbance of the terms. Movement of goods are for this reason more direct and immediate though not less far-reaching in their effects on the price-level than the movement of funds.

V

Whether long-term capital moves across national frontiers in the shape of liquid funds or capital goods, it serves to break down the immobility of factors between countries and to link their demand and supply of waiting together with uncertainty-bearing. This service rendered by capital movements has an

important bearing on the trend of monopolistic and oligopolic trade, which we shall examine in the present section.

As capital either in one or the other form is transferred from country *A* to *B* it may be combined in such industries in *B* whose raw materials are exclusively located in that country, e.g. camphor, rubber, nickel. By means of liquid funds and specialized machinery these industries are developed so that with the passage of time the products of the industries are produced under increasing returns. Here the conditions of monopolization have arisen and, provided that the industrialists are brought under central syndicate or state control, country *B* becomes a monopolist.[1] The development of the trade monopoly is usually assisted by the import of foreign capital. This is mainly true about the raw material monopolies in colonial countries which are usually deficient in their capital resources. In general it can be maintained that if *B* is an industrially depressed region and the raw materials for which it possesses a natural monopoly cannot be fabricated without a high technical coefficient of capital, *B*'s export monopoly may probably not be developed without capital investments and particularly risk-bearing imported from abroad.[2]

Now consider another situation in which *A* sends its capital to *B* wherein it is combined with existing raw materials so as to develop new industries in competition with those of other countries. The ensuing capital development though accompanied by increasing returns will, however, not confer on *B* the export monopoly of products of the new industries. The competition from established industries in old countries will have to be faced. In the process of meeting foreign competition new innovations are made, technical progress fostered and new varieties developed. Here the conditions of oligopolic competition have come into effect. In

[1] See *ante*, ch. I Sut vi.

[2] In such cases the export monopoly in *B* would be usually organized and controlled by the entrepreneurs in *A*.

consequence it is possible that the trade monopolies of other (old) countries may be effectively breached. Such a situation is also to be met with in the history of colonial development in our times.

Clearly enough these two are simple extremes between which there exist various possibilities and degrees of market control arising from capital development in the new countries. International transfers of capital are progressively reducing the differentials in the rates of economic development between different parts of the world.[1] Whether we take up the raw material producing colonies or agrarian countries the process of industrialization in them is the result of long-term investments from the older countries. The process will shift the localization of industries and change the direction as well as the composition of trade. There is already to be noticed a rapid growth of business enterprise in all parts of the world, fostered mainly by foreign capital but slowly being taken over by domestic capital.[2] Such a trend will affect international trade in two ways which work in opposite directions. First, there is bound to be a shrinkage in the volume of world trade in finished commodities especially of the commoner sorts such as textiles which can be fabricated easily in the new countries. Secondly, the increase in the national dividend in the latter consequent upon their industrialization will call forth a greater demand for specialized finished and capital goods.[3] It is probable, however, that the resultants of the two tendencies may be in the direction of the former, so that with the growth of industry in different parts of the world there may come about a decline in the aggregate volume of world trade. If this were to happen in the

[1]Carl Wright offers an interesting analysis of past and present economic development in the old and new countries, and its effects on the exports of capital and consumers' goods *Economic Adaptation to a Changing World Market*, pp 95 ff

[2]See J B Conddiffe *Reconstruction of World Trade* ch. x ('New Aspects of Industrial Organization') for an interesting account of the spread of business enterprise in different parts of the world and its repurcussions on world trade Also A. J Brown, *Industrialization and Trade*, pp 16 ff

[3]cf Iversen, op cit, pp 181-2; P. B Whale, *International Trade*, p 241

future, the domestic trader will be in a large measure secure from foreign competition thereby acquiring greater control on the home market. Hence the domestic industry may be developed in the depressed regions but the consumers will have to pay high prices for home-produced goods during the period of industrial growth. The choice would, therefore, be between an increase in employment in the new home industries and a decrease in consumers' welfare consequent upon a period of high costs and prices. It should be the task of long-range commercial policy to decide upon the choice.

vi

We emerge into the last stage of our inquiry where we have to consider such types of commercial policy as are the product of uncertainty. Let us, however, be clear as to how this uncertainty differs from that examined in the preceding sections. While money is a means of insuring an individual from the price- and income-uncertainty of the future, and capital investment is equally bound up with this sort of uncertainty; commercial policy aims at insuring a whole economic system from uncertain trends in foreign trade likely to threaten the internal stability of the system. Tariffs, bounties, dumping, embargoes, quotas, exchange control are all the instruments whereby the government of a country plans its commercial future according to what it considers to be the beneficial policy for its country. The incentives are not only economic but political as well; for instance, the desire to attain national self-sufficiency for making the country safe from external dependence in times of war. Our purpose is to outline the effects which follow from the pursuit of such policies and to co-ordinate them with our analysis of the previous chapters. The policies will be considered under two divisions: first, quantitative restrictions of trade and second, restrictions on the free operation of foreign exchange, familiarly known as exchange control.

Quantitative restrictions aim at regulating the size of imports or exports destined for all the foreign markets or else particular markets without controlling the prices at which the imports or exports could be sold. It is obvious that this would immediately affect the volume of import or export trade and through this the terms of trade. The usual policy in the inter-war period, especially after the depression, is to assign import quotas to different countries in some arbitrary proportion. It is best to take import quotas as representative of quantitative control of trade.

Suppose country A trading with B, C and D imposes discriminatory import quotas on the latter so that B is allowed to sell 25%, C 35%and D 40% of x of a commodity X imported by A. Provided that the demand curve of A for x is less than infinitely elastic, the import price in A will now come to have a 'floor' or 'floors' below which it cannot fall. The price-floors will be governed by A's demand elasticity of $x/4$, $7x/20$ and $2x/5$ quantities imported from each of the three sources. The home producers of X will now be secure of being undersold in the home market and moreover they will be able to capture a large part of the home market by reducing the price of X below the import prices. If they can adjust the cost structure of their industries they should be able to maximize their profits by equating marginal cost with marginal receipts. Thus they may be able to establish a virtual monopoly of the home market. In case there is a change in the demand conditions in A or the supply conditions in B, C and D the government of A can revise the total and relative magnitude of the quotas. Since the foreign competitors are not certain that their shares may be unfavourably revised, they will sell as much as possible within the stipulated maximum. This uncertainty of a steady flow of exports to A from countries B, C and D stands in contrast with the certainty of stable prices in country A's home-market.

Under these circumstances the foreign countries may be easily induced to retaliate by imposing counter import quotas on the imports from *A*. The aggregate volume of world trade will be reduced, import prices will rise and home producers come to enjoy monopoly privileges in the home market. With the onset of quota and counter-quota control the trading countries are likely to resort to quota bargaining and bilateral treaties.

As can be readily inferred from the above account import quotas aim at limiting price-fluctuations, yet they enable the home producers to acquire home-market control. For the foreign competitors they involve the risk of discrimination and arbitrary reduction in the entry of imports. Monopolistic and cartellized trading is the counterpart of import quotas and import monopolies. The latter are the direct consesequence of state policy to protect home industries from foreign competition and thereby maintain a stable price-level at home. Bilateral trading is sometimes a concomitant, sometimes a consequence, of quota restrictions. The net effect of all these is to reduce the volume of world trade and, therefore, the international net product at the margin of employed resources. Once the consumers and producers of a country come to realize the uncertainty of a steady flow of foreign trade they will rely more on internal trade and production, and greater reliance will be placed on the development of home industry and employment provided by the home-market. Thus a cumulative process is likely to be set up by following restrictionism as a commercial policy.

Next we shall consider exchange control as an instrument used by governments to combat the uncertainty of commerce. As a measure to reduce the temporary exchange fluctuations of inconvertible paper currencies exchange control has been practised since the establishment of Exchange Equalization Funds. In more drastic forms, however, it has aimed at the rationing of import and export of currencies for

the regulation and regimentation of commodity trade. Whether employed in the former or latter way the instrument is designed to insulate the home market from untoward changes in the external value of a county's currency. It is also used by the state for planning a policy of stabilization and expansion of home employment

Let us consider the effects of enforcing exchange control on market imperfection under dynamic conditions. Suppose three countries *A*,*B*, and *C* operating on free exchanges in a regime of inconvertible paper currencies resort to exchange control of the moderate type. All these now undertake to maintain their exchanges at fixed parities subject to revision when all of them are agreed that exchanges in the conditions of reciprocal demand warrant these. As the parities are maintained by the Central Banks of the three countries speculative dealings will be minimized. The international and export producers are now secure from the risk of exchange rate fluctuations and hence the latter will be encouraged to undertake long-run investments. There is, however, a danger of the official exchange rate falling out of step with the purchasing power and hence the currencies being either over- or under-valued. In case of over- or under-valuation there will be disturbances in the short-term and long-term movements of capital funds, and in extreme cases of over-valuation flight of capital may set in. These dangers are however internal in any system of rigid exchanges and can be only overcome by a wise and concerted banking policy in *A*, *B* and *C* countries. Rigidity of exchanges would affect the monopolists and oligopolists mainly in respect of their price policies in the importing countries. Since they are certain that the foreign value of their wares will not fluctuate from the internal value through the passage of time they will be able to follow the same price policies abroad as at home. The longer investment plans that they are encouraged to adopt and the small risk of exchange rate fluctuations to which they are

exposed will imply a relatively smaller excess capacity in their firms and hence ensure a greater approximation to optimal size.

Now turn to the extreme type of exchange control wherein the countries *A*, *B* and *C* impound their individual supply of foreign exchange so as to protect the prices and costs at home from the depreciation of the exchange rates. Suppose all the three countries resort to the rationing of foreign currencies. The interplay of reciprocal demands breaks down and in its place there is now set up a deliberate regulation by each country of the direction and composition of its foreign trade. It is open to all the three countries to enter into a multi-lateral treaty, but since it is very improbable that they can all get favourable terms by this method, each will be induced to enter into bilateral agreements with the other two countries. The struggle for favourable balance of trade as between these countries can only be decided by the individual bargaining strength of each. The bilateral clearing agreements will, however, block multi-lateral surpluses and the country which depends largely on these will in consequence stand to suffer most. The maintenance of stable prices is no doubt of benefit to the home producers, yet, as it confers on them the control of the domestic market the consumers come under their sway and have to pay unfair prices. In a system of bilateral clearings the export traders cannot be certain that their foreign markets will not be restricted or deprived by retaliatory control on exchanges and import quotas. The trade situation in *A*, *B* and *C* countries under the above conditions will be characterized by the traders acting upon certain expectations of stable prices and employment in the domestic market, but upon uncertain expectations as regards the future course of imports and exports.

The commercial experience of the inter-war years abundantly bears out the theoretical analysis of this section. We have lived in a regime of international

trade where the consumers and producers have shown a growing dependence on the home market and a declining confidence in foreign markets, thus in the international division of labour. The wave of restrictionism which swept over the leading commercial countries of the world during this period gave strength to domestic producers as a result of which they have been able to dominate the home markets without much fear of foreign rivals. The shrinkage in the inter-war years is a symptom of the decline of competition and the growth of control in the international commodity markets. Ricardo and Malthus proclaimed that the development of foreign trade increases the 'sum of satisfactions' and the 'mass of commodities'. If we still share their conviction—and rational judgement leaves us no option—the aim of our commercial policy can be none other than the liberation of foreign trade from quantitative and monetary restrictions of all sorts.

INDEX OF AUTHORITIES QUOTED

INDEX OF SUBJECTS

LIST OF BOOKS

BY THE STAFF AND STUDENTS OF THE ECONOMICS DEPARTMENT OF THE SCHOOL OF ECONOMICS AND SOCIOLOGY, BOMBAY

ANJARIA, J. J., LAKDAWALA, D. T. & SAMANT, D. R., *Price Control in India with special reference to Food Supply* (Popular Book Depot, Bombay, 1945)

ANJARIA, J. J., LAKDAWALA, D. T. & PANDIT, S. A., *War and the Middle Class : An Inqiry into the effects of war-time Inflation on middle class families in Bombay City* (Padma Publications, Bombay, 1946)

AGRICULTURAL SECTION OF THE BOMBAY UNIVERSITY DEPARTMENT OF ECONOMICS, *Food Crops of Gujarat* 1939-46 (The People's Provincial Food Council, Bombay, 1947)

CHOLIA, R. P., *Dock Labourers in Bombay* (Longmans, Green & Co., Ltd, Bombay, 1941)

DANTWALA, M. L., *Marketing of Raw Cotton in India* (Longmans, Green & Co., Ltd, Bombay, 1937)

DHOLAKIA, H. L., *Futures Trading and Futures Markets in Cotton with special reference to India* (New Book Co., Bombay, 1942)

LAKDAWALA, D. T., *Justice in Taxation in India with special reference to Gujarat* (Popular Book Depot, Bombay, 1946)

LIMAYE, D. H., *Some Aspects of India's Military Finance* (New Book Co., Bombay, 1939)

MUKHTYAR, G. C., *Life and Labour in a South Village* (Longmans Green & Co., Ltd, Bombay, 1930)

PANDIT, Y. S., *India's Balance of Indebtedness*, 1898-1913 (George Allen & Unwin, London, 1937)

PATEL, A. D., *Indian Agricultural Economics* (D. B. Taraporewala Sons & Co., Bombay, 1937)

PINTO, P. J. J., *System of Financial Adminisrtation in India* (New Book Co., Bombay, 1943)

RANADIVE, B.T., *Population Problem of India with special reference to Food Supply* (Longmans, Green & Co., Ltd, Bombay, 1930)

RAO, V. K. R. V., *Taxation of Income in India* (Longmans, Green & Co., Ltd, Bombay, 1931)

RAY, R. M., *Life Insurance in India: Its History Law Practice and Problems* (Allied Publishers, Bombay 1941)

SALVI P. G., *Commodity Exchanges in India* (The Co-operators Book Depot, Bombay, 1947)

SAMANT, D. R. & MULKY, M. A., *Organisation and Finance of Indusdustries in India* (Longmans, Green & Co., Ltd., Bombay 1937)

SHAH, K. T. & KHAMBATA, K. J., *Wealth and Taxable Capacity of India* (D. B. Taraporewala Sons & Co., Bombay, 1925)

SHAH, K. T. & BAHADURJI, G. J., *Constitution Functions and Finance of Indian Municipalities* (Indian Newspaper Co., Bombay, 1926)

SHAH, K. T., *Russian Experiment* (D B. Taraporewala Sons & Co., Bombay, 1929)

Federal Finance in India (D. B. Taraporewala Sons & Co., Bombay, 1929)

Sixty Years of Indian Finance (D. B. Taraporewala Sons & Co., Bombay, 1921)

Indian Currency, Exchange & Banking (D. B, Taraporewala Sons & Co., Bombay, 1922)

Trade, Tariffs and Transport in India (Ramchandra Govind & Son., Bombay, 1923)

SHUKLA, J. B., *Life and Labour in a South Gujarat Taluka* (Longmans, Green & Co., Ltd, Bombay, 1937)

TIWARI, R. D., *Railway Rates in Relation to Trade and Industry* (Longmans, Green & Co., Ltd, Bombay, 1937)

Modern Commercial Policy: A Study in Technique (New Book Co., Bombay, 1942)

VAKIL, C. N., *Financial Developments in Modern India*, 1860-1924 (D. B. Taraporewala Sons & Co., Bombay, 1925)

VAKIL, C. N. & MURANJAN, S. K., *Currency Prices in India* (Longmans, Green & Co., Ltd, Bombay, 1927)

VAKIL, C. N., BOSE, S. C. & DEOLALKAR, P. V., *Growth of Trade and Industry in Modern India: An Introductory Survey* (Longmans, Green & Co., Ltd., Bombay, 1931)

VAKIL, C. N., *Economic Outlook in Federal India* (University of Delhi, 1933)

VAKIL, C. N. & MUNSHI, M. C., *Industrial Policy of India with special reference to Customs Tariff* (Longmans, Green & Co., Ltd. Bombay, 1934)

VAKIL, C. N. & MALUSTE, D. N., *Commercial Relations Between India and Japan* (Longmans, Green & Co., Ltd, Bombay, 1937)

VAKIL, C. N. & PATEL, M. H , *Finance Under Provincial Autonomy* (Longmans, Green & Co., Ltd, Bombay, 1940)

VAKIL, C. N., *The Falling Rupee* (The Author, 1943)
The Financial Burden of War on India (The Author, 1943)

VAKIL, C. N. & ANJARIA, J. J., *The Future of the Rupee* (Popular Book Depot, Bombay, 1945)

VAKIL, C. N., ANJARIA, J. J. & LAKDAWALA, D. T., *Price Control and Food Supply with special reference to Bombay City* (N. M. Tripathi & Co., Bombay, 1943)

VAKIL, C. N., *Our Sterling Balances* (National Information & Publications Ltd, Bombay 1947)