Economic Union Between Nations and the Location of Industries

This paper is concerned with the question : " How would the economic unification of several national economies (e.g. a Western European Union) affect the location of industries and hence the economic structure of the countries joining the union ? " In Section I attention will be drawn to a locational consequence which is due to the discriminating influence of space in large free-trade areas, and in Section II another locational effect will be dealt with, which has been emphasised by Mr. Rothschild,[1] and which is based on the discriminating influence of monopolies. After an examination of the correctness and importance of Mr. Rothschild's argument the question will be discussed whether both consequences will work in the same direction or will tend to neutralise each other.

I

In order to recognise these locational consequences in their strongest form, the following argument is based on the extreme model of an economic union in which legal barriers to trade and factor movements do not exist at all. Unless we refer to economic policy and taxation *expressis verbis* a complete *laisser-faire* system is assumed and the existence of governments is ignored. This will give us a clear idea of the measures necessary to encourage desirable consequences or to prevent undesirable ones.

1. As we are not concerned with an explanation of the existing pattern of industries, but with prospective changes caused by the formation of an economic union, we may leave out of account natural resources and their distribution and focus attention on the locational influence of barriers to trade and factor movements. Once we know in what direction they have worked, we are able to recognise which tendencies will be strengthened or weakened by their abolition. Let us isolate the locational influence of a border in a simplified model based on the following assumptions :

(1) There is a large plain in which transportation costs are proportional to distance. (This is in order to exclude any initial influence of the transportation system.)

(2) Natural resources (which are of minor importance in our problem), population, and production units are equally distributed all over the area. The latter are assumed to be only self-sufficient farms of equal size.

(3) The plain is a circle and is surrounded by a desert which isolates the former completely from the outside world. The desert may be regarded as the strongest possible substitute for a national frontier and a barrier to international trade and factor movements. (In the next part of this section (I (2)) we shall see that the difference between a desert and a present-day national frontier is only one of degree.)

Our plain economy is thus in a situation which may be described as locational equilibrium. How will this equilibrium be changed if we introduce one dynamic element which plays an important role in reality, i.e. capital growth ? Let us assume that any one of the peasants decides to produce one product—say beer—in excess of his own wants to sell it on a market. He soon will find that he cannot sell his product

[1] K. W. Rothschild, " The Small Nation and the World Trade," *Economic Journal*, LIV (April, 1944), pp. 26–40.

everywhere, but only within a certain market area where the costs of transporting the product to the buyer are not greater than the economies of large-scale production, if he wants to maximise his profits.

This is shown in Fig. 1. Let us assume that d is the demand curve for each of his neighbours :

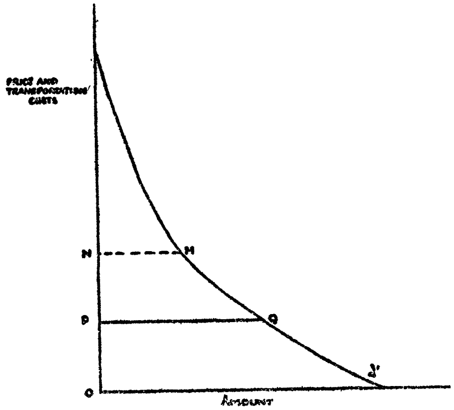

Fig. 1

and OP the price f.o.b. Brewery, which is located in Q. People living in Q will buy an amount of PQ bottles of beer. People living in M will buy only NM bottles, because the price for them includes the additional transportation cost PN. As no beer will be sold in F, PF is the extreme selling radius for beer and the amount sold by this brewery is equal to the contents of the cone—which arises by moving the triangle FPQ around the axis PQ—multiplied by a constant factor which is determined by the density of population).[1]

Other farmers will try the same business, but they will choose their locations outside the market areas of the already existing breweries, so that a network of markets for beer arises. (It may be added for reasons of accuracy that these market areas will be hexagons, because (1) a network of circles would leave certain areas uncovered and (2) the hexagon is that geometric form, fitting into a network, which is most similar to a circle.) The breweries thus are equally scattered over the plain.

What applies to beer applies *mutatis mutandis* to every other commodity produced in excess of the wants of the producers. Hence we get a network of markets for every commodity. The lower the costs of transportation of the product and the greater the internal economies of large-scale production, the larger will be the market areas and the fewer firms will emerge. But what is important for our argument is that the larger the market areas the less will the entrepreneurs choose a location near the frontier. There may be one or more commodities, the market areas of which cover the whole plain. Their ideal location is just in the centre of the plain, so that the centre will be chosen by more firms than any other location. If we conceive the networks of the various commodities as lying one on the other we can easily see that the whole system of networks tends to become denser in the centre than at the extremities.

This initial tendency for agglomeration[2] is cumulative, as can be seen, if we look closer into the process which emerges out of this situation. Due to the complementarity between capital and labour, agglomeration in the centre presupposes either some form of unemployment in the centre (for instance, disguised unemployment), or immigration of workers from other parts of the plain, presumably from the extremities. In the first case there is no problem ; in the second case the question how much real wages

[1] By this assumption two problems are excluded which are not so important as to justify a detailed discussion in this connection. The first one is the problem of the optimum size of the firm, the second one is the determination of the optimum output under given cost and demand schedules. It may be assumed that our producer has solved both questions by respective estimates or by trial and error, and that OP is just the price which equals marginal cost and marginal revenue. For a detailed discussion of these problems under spatial aspects, see e.g. August Lösch : *Die raeumliche Ordnung der Wirtschaft*, Jena, 1940, p. 67.

[2] The term agglomeration is not so ambiguous as concentration which is used to describe different phenomena. The former has been introduced into location theory by the writings of Professor Alfred Weber. Cf. " Ueber den Standort der Industrien," Part I, " Reine Theorie des Standorts " or " Industrielle Standortlehre," in *Grundriss der Sözialokonomik*, Part VI. The former has been translated by C. J. Friedrichs as : *Alfred Weber's Theory of the Location of Industries*, University of Chicago Press, Chicago, 1928.

must be higher in the centre to attract workers depends on whether or not there is unemployment elsewhere. If we assume full employment all over the country the necessary differences in real wages must at least be equal to the amortisation of the cost of migration (within a reasonable length of time), plus a compensation for the loss of the old environment. This does not necessarily mean that nominal wages must be higher in the centre, for at least some goods, which are only produced in the centre, will be cheaper there than elsewhere. Furthermore, the disutility of working in factories may be less than that of agricultural work, at least for a part of the working population. But even if nominal wages must rise in the centre producers will not choose another location because of this. On the one hand they will take into account cost reductions due to the external economies of agglomeration : lower transportation costs for materials which they have to buy from other firms, the advantages of having personal contact with suppliers and bankers, and so on. On the other hand additional workers mean at the same time additional consumers, and the concentration of population in the centre causes either new outlet for new firms or greater outlet for the already existing firms. Both means new investment in the centre. Furthermore, we must take into account that the transportation system will at first be improved in the centre, which creates new external economies there. It is true that prices of land and rents will rise in the favoured area, but it would be highly unrealistic to argue that this could inhibit the initial tendency for agglomeration or stop the process at an early stage, for, nevertheless, agglomeration is a real phenomenon of our world. On the other side, agglomeration often ceases long before the physical limits of skyscraper building are reached. To explain this, it seems to be appropriate to assume, that rents are rising rather in response to given advantages than in anticipation of prospective ones,[1] while the decisions of entrepreneurs buying land or renting buildings are based on expected advantages. As long as the latter are greater than the existing ones the process of agglomeration continues while it is bound to stop as soon as additional advantages are no longer likely.

At the present stage the argument can be summarised as follows : Capital growth in connection with indivisibilities and rent-lag causes agglomeration of economic activities. The gravitation centre is determined by the desert. If it were possible to measure economic activity per unit of space in the vertical direction with the plain as the base, the stationary state, we started from, would resemble a block, whereas capital growth changes it into a cone-like body. It must be emphasised in this connection that there is only a very superficial similarity between this analysis and that of Thünen.[2] In Thunen's case the centre is already given by the assumption of a town in the midst of an isolated plain ; his " belts " relate to agriculture only and are not belts of decreasing economic intensity. Finally, he does not introduce dynamic elements such as capital growth or lags.

2. As we have seen, the border (or desert) tends to push away economic activities, while the centre attracts them. It might be argued that our desert has little to do with national frontiers and tariff walls and that the above model does not tell us very much for our present problem. To show that the difference between our desert and a national frontier is only one of degree, we may draw a tariff wall through a given market area as described above, but for the sake of simplicity it may be assumed to be a circle (Fig. 2).

[1] An elaboration of the theoretical background of the assumed kind of rent-lag would lead beyond the scope of this article and must be omitted for this reason.

[2] Johann Heinrich von Thünen : *Der isolierte Staat in Beziehung auf Landwirtschaft und Industrie*, Hamburg and Rostok, 1826–63.

Let A be the location of the firm in Westland, AH the radius of its market area, and GB the new national frontier. The introduction of an import-duty in Eastland, which is equal to the transportation cost from J to H, shortens the radius of the market area in Eastland by the same amount. The eastern limitation of the market area is now $BCJFG$. (Where $AC = AJ$.)

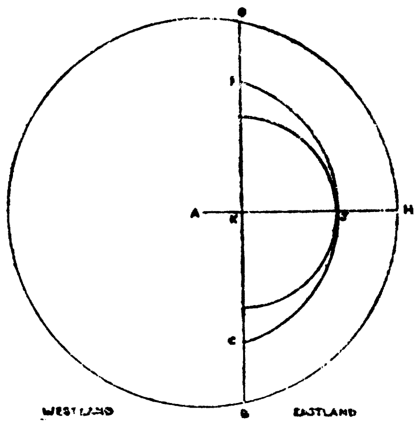

Fig. 2

If K is the only customs-station through which the product can pass from A to Eastland, the market area in Eastland is limited by a circle around K with the radius KJ $(AJ - AK)$.[1] A is no longer the optimum location for the firm. It will tend to widen its market in Westland, as compensation for the loss in Eastland. However, a larger amount can only be sold in Westland if the firm moves from the location near the new frontier to a location which lies closer to the centre of the new area of Westland.

These effects of economic frontiers are enforced by their coincidence with political boundaries. Even if *laisser-faire* policy is pursued in both countries, different laws, languages, and currencies, and the existence of some kind of patriotism and of a higher degree of uncertainty with regard to the market situation beyond the border make the national frontier a line which cuts through the network of markets. Further, if we remember quantitative trade restrictions, exchange controls, administrative protection, economic nationalism, or policies of national economic self-sufficiency, the analogy between national frontiers and deserts (as in our first model) is not so unrealistic as it seemed to be.[2]

3. The phenomenon which has so far been analysed is due to national frontiers and may therefore be called national agglomeration. Before we can try to answer our question, we must deal with another form of agglomeration tendencies which is—so to speak—superimposed to the former and may be called international agglomeration. While the causes of the former will be abolished by the formation of an economic union, the causes of the latter will be unaffected.

To explain international agglomeration we may return to our first model and drop the assumption of the surrounding desert. Let us regard the area as indefinite, or more realistic, let us include the whole world. Instead of an equal distribution of resources we now assume that a particular location or region has certain advantages—say mineral deposits, skilled labour or a climate favourable to those branches of production which are important for the first stage of the industrialisation process. In the first model the favoured location and hence the gravitation centre was only determined by the desert, now it is explicitly assumed. As soon as capital growth, internal and external economies (due to indivisibilities), and rent-lag are introduced, the advantages of the favoured location cumulate, an agglomeration centre necessarily

[1] A similar diagram is presented in: E. M. Hoover's *The Location of Economic Activity*, New York, Toronto, London, 1948, p. 220. For a broader discussion of the effects of boundaries based on empirical evidence see especially part three of this book.

[2] As a matter of fact new frontiers often depressed economic life in the regions concerned. These distressing effects, however, would have focused much more attention on this problem, if they had not often been drawn along mountains (which are normally very thinly populated so that one is inclined to ascribe the low degree of economic activities only to the scarcity of nature) or along rivers (which are normally very densely populated, so that the density of population is reduced to a degree, which seems to be quite normal). Cf. also: Lösch, op. cit.

arises, and the spatial distribution of economic activities acquires the same cone-shape as in the first model.

Looking at the actual distribution of industries in the world we find this result not very unrealistic, especially if we try to conceive distance not in geographic but in economic units (such as transport cost units), whereby the width of the Atlantic Ocean is diminished and the highly industrialised areas of the western world come very close together, thus forming the industrial centre of the world. In 1936–38 the U.K., France, Belgium, Germany and the U.S.A. accounted for more than half of the world's manufacturing production.[1] The picture would be even more impressive if regional figures existed, for most of these countries include vast agricultural regions. It would then be quite obvious that half of the world's manufacturing output is produced in rather small areas, which—in terms of transport cost units—lie very closely together.

It is true that other influences, which must be regarded as historical accidents from the theoretical point of view, have played an important role in shaping the industrial structure of the world, but they must not be over-emphasised. Even the distribution of population is not an independent datum but subject to locational influences. What may be called regional agglomeration is the cause of the rush to the town; national and international agglomeration combined are the causes of the westward migration of workers from eastern Germany and eastern Europe to the Ruhr since the beginning of the industrialisation of that region.[2]

4. What is then the relation between national and international agglomeration? Apart from countries lying in the centre of international agglomeration (in which national and international agglomeration may have worked in the same direction) national agglomeration has counteracted international agglomeration. Therefore it can be conceived as a form of international deglomeration. In Europe national agglomeration, due to tariff walls, trade restrictions, political frontiers and economic nationalism has worked in the past, as if a broader distribution of industries had been aimed at. In that respect Europe differs very much from the United States. Nevertheless, it seems, that the proponents of protectionism were hardly aware of this effect. There are some reasons to suppose that if free trade had always prevailed since the beginning of the industrialisation period, the concentration of the world's industrial capacity in the United States would have proceeded to a higher degree. The diminution of the German share in the stream of migration to the United States from over 20 per cent between 1830 and 1890 to 16 per cent in the 'nineties, and 4 per cent in the first decade of the twentieth century[3] appears at least, to some extent, as a lagged effect of Germany's passing over to protectionism at the beginning of the 1880's.

The locational consequences of the formation of, for example, a Western European Union can now be described by the following general statement: The abolition of barriers to inter-European trade and to inter-European movement of factors will weaken the deglomeration effect of national agglomeration and will thus enforce international, or more precisely, inter-European, agglomeration. It will strengthen the attractiveness of the highly industrialised centre both for labour and capital. Towns and regions with artificial advantages due to national agglomeration will become disadvantageous. On the other hand, particular regions near the industrial centre, which have suffered under the depressing influence of national borders, will gain instead.

[1] Cf. League of Nations: *Industrialisation and Foreign Trade*, p. 13.

[2] Cf. Wilhelm Brepohl: *Der Aufbau des Ruhrvolkes im Zuge der Ost-West-Wanderung: Beiträge zur deutschen Sozialgeschichte des* 19 *und* 20 *Jahrhunderts*, Bitter, Recklinghausen, 1948.

[3] John A. Hargood: *The Tragedy of German-America*, New York, London, 1940, p. 57.

In the short run it is very likely that these tendencies will be counteracted by more or less voluntary reductions of wages and profits in the adversely affected regions. Little else will happen in the short run, if the margin of the possible reduction both of wages and profits is great enough to offset the price reduction of respective products enforced by the abolition of the trade barriers. The margin of profit reduction, however, is limited as well as that of the wage reduction.

Let us at first regard the situation of entrepreneurs in the short run. A short run period may be defined as that period in which an adjustment is possible only by shifting the *existing* capital equipment, either to new uses or to new places, whilst in the long run the additional possibility of adjustment via new investments either in new branches or in new places exists. In order to simplify the situation it may be assumed that the possibilities for shifting the capital equipment to new uses are negligible. The only alternative to a reduction of profits then is the shifting of equipment to a better location. Profit in this case can only be reduced to that amount which the entrepreneur expects to get at the best location he can move to with his capital equipment, minus an annual amount composed of amortisation and interest for the costs of moving. This margin of the possible profit reduction can be conceived as a rough measure for the spatial immobility of capital in the short run.

As to workers we have a similar situation. The possible real wage reduction in the short run is limited by the highest real wages which workers can expect to earn at a better location minus an amount which covers the amortisation of the cost of migration and a compensation for the loss of the accustomed environment. This amount again can be regarded as a rough measure for the spatial immobility of labour in the short run. If the artificial advantage of an industry in a particular location (due to the restriction of international trade or national agglomeration before the formation of the union) is greater than the sum of the possible wage reduction and the possible profit reduction in the short run, then the original location will be given up even in the short run. It is not probable that this will happen very often, but it has to be realised that any interference of trade unions in favour of equalising real wage rates and in favour of keeping wages high in the adversely affected regions must have a distressing influence on the industrial structure of those regions. Lower real incomes, and particularly lower wages in regions with locational disadvantages, are the only means to prohibit an outflow of capital, to neutralise the agglomeration tendency, and, instead of this, to attract new capital, unless, and this qualification has to be kept in mind, some sort of spatial economic policy is adopted by the union.

The situation may even be more serious, if unemployment due to an artificially high wage level is already existing in such a country when it joins the union. The psychological pressure to emigrate is probably much stronger if workers have already been unemployed for a long time. Instead of capital movement into such a region people will move to capital, that means to the centre, and if they can, decrease wages there.

What has been said about the situation in the short run applies *mutatis mutandis* in a higher degree in the long run, where we must take into full account economic growth. Then spatial mobility of the factors is greater. As for capital, a change in its spatial distribution proceeds through the channels of new investment, and a firm can move more or less gradually by using the depreciation fund for investment in a new location, founding a branch of the firm there and expanding it at the cost of the main firm. It is true that even this is not done so easily as it is said, but it is much easier than under short-run conditions. And the high spatial mobility of liquid capital, which becomes important in the long-run, need only be mentioned in this respect.

Much could be said about the long run mobility of labour in relation to the growth rate of population, to education, and to the national character, but it would involve sociological and psychological questions. However, it may be sufficient to remark that, with some qualifications, the mobility of labour is considerably greater in the long run than in the short run.

If this is true, and if it is further true that national frontiers and tariff walls have caused a deglomerating effect on the industrial structure of Europe, then the long-run effects of creating a large area of free trade and free movement of factors will—other things being equal—enforce the agglomeration of industry and population in the industrial centre of the union. It may be added that this argument applies rather to continental countries than to Britain ; for the influence of transportation costs in an island is relatively small because of the cheapness of the sea transport. In term of costs, therefore, the northern part of the United Kingdom is nearer to the centre than—say—south-western France or Austria.[1]

6. If our general answer as regards the locational consequences of the formation of an economic union is right, the question arises whether or not these tendencies are desirable.

On the one hand, complete freedom of trade and a new spatial combination of factors is a necessary condition for raising productivity in the union by a higher degree of specialisation both between the industries and the regions. The advantages of an extended free trade area depend to a large extent on the ability of entrepreneurs to produce in the most advantageous location. On the other side we must consider the difference between money costs which go into the accounts of the firm and into the calculation of the entrepreneur—and the social costs. Choices of location by entrepreneurs are based on private costs. In the case of agglomeration, external economies for the individual firm are taken into account, while the social costs which arise in connection with the concentration of population in a rather small area are not considered.

Furthermore, it should be realised that external economies which are both causes and consequences of agglomeration in the gaining regions have a counterpart in the form of decreasing external economies in the adversely affected regions. The shifting of factors from the latter to the former causes a vacuum and a deterioration of business efficiency in the latter. The development and use of natural resources in them may become more difficult, because their exploitation may only be profitable in connection with a certain rate of capital growth. In a growing economy a stop in the industrialisation process or a smaller rate of growth in one region compared with the rates of growth of other regions already means an absolute disadvantage. If one firm or one industry shifts gradually from one region to another it causes external economies in the new location, both for the firms already existing there and for itself. It can be assumed that this effect is intuitively anticipated in the calculation of the moving entrepreneurs. But the adverse effect in the location they are leaving, on the other firms there, and on the natural resources, the development of which may become more difficult, does not go into the entrepreneurial calculation as a negative item. It necessarily follows from this that agglomeration tends to go beyond the social and economic optimum.

7. If this is true it will be necessary to find a substitute for the deglomeration effect of national borders and customs walls. The substitute must be an instrument which is precise enough to distinguish between the advantageous process of regional

[1] The fact that transportation costs are relatively unimportant for Britain can be regarded as one of the causes why the theory of comparative cost, developed in this country, did not regard the space within the countries at all and regarded the countries as points, as August Lösch has put it. (Cf. his article : " Wo gilt das Theorem der komparativen Kosten ? *Weltwirtschaftliches Archiv*, Juli, 1938, especially p. 48.)

specialisation and the abuses of agglomeration beyond the social and economic optimum. The argument, therefore, is not in favour of tariff walls. We may rather think of a specific location tax which offsets the social costs. Subsidies, paid to firms in locations with potential advantages which would become actual in connection with a certain degree of agglomeration, would—as a counterpart—be appropriate to increase welfare.

The same result could be reached by regional differentiation of transportation costs and by a specific investment policy of the railways, as well as by building roads and waterways in particular backward areas. By means of such sort of regional economic policy it might be possible to secure the advantages of specialisation without the disadvantages of too high a degree of agglomeration.

II

The question of the location of industries in an economic union has been approached from a different basis by Mr. Rothschild in an article "The Small Nation and the World Trade."[1]

1. He starts from the distortion of the price structure through the existence of monopoly rents and profits. Under these conditions the establishment of an economic union would only lead to a different location of industries, not to a better one. Even the world, and *a fortiori* regional blocks, would be too small to prevent the growth of a monopolistic and oligopolistic environment over a wide field of economic activity due to the decline of population growth and the end of colonial expansion. In the case where two monopolies lie in two different countries which are divided by a tariff wall, the abolition of this tariff would create a duopoly. But the result of a game of bluff, compromise, and political intrigue, would be the emergence of one monopoly in the larger area. He regards it as a conceivable solution that one plant would be closed down and that the production then would be concentrated in the other one, even, and this statement is remarkable, if both are equally efficient. The output of the surviving plant, though greater than before, would be smaller than the total output of both plants before the abolition of the tariff. The price of the commodity would, therefore, rise in both countries. As to the location effect, he says that the new industrial centre would by no means gravitate to those points where the economic advantages of production were greatest. For the victory would go to those firms which occupy the best strategic positions and which, through their size, have sufficient reserves to swallow smaller concerns. That means production would tend to be centred in those industrial countries which already provide large domestic markets before the formation of the federal area. This would be the large countries. The bigger concern of the new federal area would be more powerful than the smaller concerns in the several countries before, and would always be able to prevent the newcomers from establishing firms in better locations and taking advantage of the changed circumstances. Further, the monopolist himself may not move to those places which have become more advantageous, because he wants to maintain the value of his equipment.

Mr. Rothschild, therefore, concludes that the greater industrial countries would become the centres of heavy and other monopolistic industries, while the smaller countries would find opportunities in the small-scale industries and in agriculture. The creation of a federal union would tend to reinforce and perpetuate the economic structure of its constituent members. Backward countries would remain backward just because they were backward before.

2. There is full agreement between Mr. Rothschild's view and the results of the foregoing analysis that the abolition of tariff walls and trade restrictions would not

[1] Rothschild, op. cit.

by itself lead to an optimum location of industries. He is right in pointing to the distorting influence of monopolies, but we cannot accept (*a*) the importance attributed to it, (*b*) the general conclusion as regards the effects on the industrial structure of the countries joining the union, and (*c*) the suggestion of permanent tariffs to shelter new industries against the aggressive tactics of the old monopolies.

(*a*) There is at first the importance of his argument. Let us examine his assertion that in the case of two monopolies in two different countries the abolition of the tariff wall would lead to a duopolistic struggle, the result of which would be the emergence of one monopoly in the federal area. It is true that this is a possible result, but it is not a necessary one, and, under certain conditions, it is not even a probable one, as we shall try to show.

At first we must introduce distance in terms of transportation costs, because the two firms are assumed to be located in two different countries and hence in different regions of the union. Each of them has a certain market area in which it is to some degree protected from the competition of its rival by a margin of transportation costs. The higher the costs of transporting the product the greater is this margin. This makes the duopolistic struggle more difficult (especially in heavy industries) and certainly raises the probability of an agreement. It would be quite a conceivable solution to divide the market, though this need not necessarily mean a restoration of the *status quo ante*. Whether or not this objection tends to weaken the importance of Mr. Rothschild's argument, especially in the case of heavy industries, may be decided by the reader ; we, however, will disregard it completely and join Mr. Rothschild in assuming that the two firms, in fact, will merge into one corporation. The question then arises, why close down one plant even if both are equally efficient ? The issue again is not so simple, unless we neglect distance and transportation cost. It is true there are many cases where the simple adding up of two identical demand curves, which Mr. Rothschild has in mind, leads to the result that the profits of the remaining plant will be more than twice as high as those of each single plant ; but we must take into account that the buyers of the firm closed down have to pay additional transportation costs if they must purchase from the remaining firm. Take the highly simplified example that at f.o.b. price 7 each of the firms could sell a quantity of 100 and at f.o.b. price 8 a quantity of 90, and that the additional transportation costs for the customers of the firm closed down are—in the average—1, then the aggregate demand at f.o.b. price 7 is not an amount of 200, but only of 190. Due to the existence of additional transportation costs the new combined demand curve is more elastic than each of the former separate curves. That means that in many cases the total profit of the remaining firm will be less than double of each firm's profit. In all these cases no plant will be closed down.

As for the remaining cases the validity of Mr. Rothschild's argument depends upon the expectations of the monopolist. If the monopolist has any hope of a rising demand in the visible future, so that it might be profitable to reopen the second plant, why should he then be willing to bear the cost of closing down one plant and reopening it again in the future, including all the trouble of getting the skilled workers back ? The implicit assumption underlying the argument, therefore, must be pessimistic expectations. It is, however, rather difficult to find good reasons for the belief that the creation of a larger free-trade area would necessarily cause sufficient pessimism to prevent expectations of further growth and rising incomes, whereas there seem to be more reasons to support the opposite assumption. Limits of space forbid us to go into detail at this point, but is fair to say that the qualification mentioned reduces the probability of the " Rothschild effect " at least in those cases where both plants are equally efficient.

If, however, great differences in the efficiency of the plants exist the less efficient one will be closed down. In relation to our location problem we may distinguish between locational and non-locational cost-disadvantages of the less efficient plant, though it is in practice impossible to draw a sharp line between them.

If one of the two plants has both kinds of disadvantages, production will be concentrated in the better location (better in terms of private money costs, not in social costs). The monopoly argument in this case coincides with our agglomeration argument.

If the non-locational advantages of one plant are considerably greater than the locational advantages of the second one, the assumed growth of monopoly may strengthen some centres of production outside the main gravitation centre of the union and may—under certain conditions—counteract what we have called international agglomeration.

(*b*) In view of the complexity and diversity of the locational consequences of monopolistic growth within the federal area and in view of the objections raised which qualify the importance of Mr. Rothschild's argument, one must be very careful in accepting the conclusion that the greater industrial countries would become the centres of heavy and other monopolistic industries, while the smaller countries had to find opportunities in the small-scale industries and in agriculture. What is a " great industrial " country, what is a " small " one ? How shall we measure that size ? Obviously we cannot take square miles. Mr. Rothschild's remark that production would tend to be centred in those industrial countries which already provide large domestic markets before the formation of the union would suggest that we have to take national income as a measure. But even this would lead to rather strange results.[1] Apart from this, one must doubt the hypothesis that the size of the monopolies depends upon the size of domestic demand. It would be correct only if the countries concerned were closed economies, which is far from being true, especially in the case of " small " countries.[2] Finally, we cannot treat countries as if they were economic units without any structural differences between their various regions. For even in " great industrial countries " we have large agricultural regions, so that it is very ambiguous to speak of a perpetuation and reinforcement of the economic structure.

(*c*) Though we can find some truth in the monopoly argument its importance is not so great as Mr. Rothschild thinks ; and his general conclusion is, strictly speaking, not correct. We now must turn to the remedy proposed : Permanent tariffs to shelter new industries against the aggressive tactics of old monopolies. This means practically nothing else than to abstain from the formation of an economic union, for such tariff walls would presumably be drawn along the old national frontiers. This, however, could not be justified by the monopoly argument alone for :

(1) This argument is valid in fewer cases than Mr. Rothschild believes.

(2) A number of them will coincide with the agglomeration effect outlined above. They can be impeded by the subtle measures proposed by him.

(3) Some of the remaining cases may have a desirable deglomeration effect.

[1] Let us take for example Belgium and Italy in a Western European Union. According to Colin Clark's estimates (*Conditions of Economic Progress*, London, 1940, p. 40), Italy's national income is more than twice as high as Belgium's. Does it make sense to apply Mr. Rothschild's conclusion in saying that the former would be industrialised and the latter had to rely on small-scale industries and agriculture ? But we would reach the opposite result if we apply the statement, that the economic structure of the countries would be perpetuated and reinforced. Both statements are only compatible under one assumption, which seems to be implied in the argument : i.e. that there is a positive correlation between the size of a country and its degree of industrialisation.

[2] Elsewhere in his article Mr. Rothchild seems to be well aware of the fact that it is just the small country which—by its limited resources—is forced to participate in international trade to a higher degree than large countries.

What is left, however, is certainly not important enough to justify old tariffs or the introduction of new ones, quite apart from the fact that tariffs are not the appropriate weapons to fight monopolies. If there is a necessity for public monopoly control—and there certainly is one—tariffs could not replace it, whereas such control easily would fulfil the task of Mr. Rothschild's tariffs.[1]

Hence monopolistic growth is not a very strong argument against the abolition of barriers to trade and factor movements ; but the analysis of Section I has shown, it is hoped, that space in large free-trade areas would be discriminatory against certain regions of a union and that we need some sort of artificial discrimination to neutralise the natural one.

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[1] Otherwise we should not hesitate to recommend the introduction of inter-regional tariffs—say—in the United States, " to shelter new industries against the aggressive tactics of old monopolists."