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# New Inland Waterway Benefits Port of Hamburg

By Dr Heinz Durgeloh, Hamburg

The deciding factor for any extension to a system of waterways is not the geographical deficiency of such a network, which may be considerable when comparisons are made with the density of a rail network—but rather the economic significance of investment in communications. Contrary to other types of transport, a waterway can only be utilised to the full if there is a density of transports on long-range traffic routes. The flow of goods necessary to support these routes means that there has to be an uneven distribution of supply and demand in the area and, since inland shipping is mainly concerned with transporting goods in bulk, its sphere of operation is concentrated in heavily industrialised zones. In terms of the Federal Republic, this means that connections between industrial centres—of which the Rhine-Ruhr area is the largest—are the only factors which determine the use of shipping.

It is at these focal points that density of transports is greatest. Next in the scale come communications with other agglomerations, including overseas ports. Only thereafter come communications from the nuclei to peripheral points and, finally, trade between the various peripheral areas. However, considered from an economic aspect, inland shipping cannot cope as well—let alone better—than other modes of transport with the flow of goods caused by the uneven distribution of supply and demand, for the high investment costs of shipping containers and waterways and the consequently high fixed-cost charges make it imperative that this traffic should be on a very large scale. The costs of loading and unloading, which are normally higher than those for rail transport, mean that longer routes are essential.

## Investment Criteria for Waterways

If the flow of goods in West Germany is studied with this in mind, it becomes apparent that although the density of communications exists in the agglomerations, transport distances are normally too short. For this reason, traffic between focal points and traffic between the nucleus and peripheral concentrations offers more scope for the use of inland waterways. A network of canals based upon these communication lines, where the separate stretches are compatible with more than one function, can withstand both economic investigation and investigation of its own profitability.

From the economic aspect, the criterion for evaluating investment in the construction of new communication routes must be whether overall economic productivity is increased by investing in such routes or whether productivity increases more when a cor-

responding investment is made in a different sector of the economy—for instance, a different method of transport. There is always an increase in productivity when a certain product—perhaps a carrier service—can be operated after the planned investment has been made at a lower cost to the economy than was possible without such investment.

The indicator for any increase in productivity is the comparison of costs which must be made for both these alternative competitive methods of forwarding bulk goods. Such a comparison must take into account for each method the “economic” cost of supplying the transport service, i.e. the amount of “working costs” to be allocated to the means of transport and the “external” route costs incurred by those responsible for such routes, insofar as these apply to the transport service under consideration, i.e. are caused by this service. In making this economic comparison, the only matter of interest is the overall economic effect of an investment upon productivity.

Decisions about such investment must also depend upon whether, and to what extent, an increased yield is to be expected. Such a prognosis can only be made by comparing the economic costs of transport service in the relationship under investigation. Considered thus, new investment in a shipping route can be economically productive even if a competitive carrier (the railway, for instance) disposes of sufficient alternative capacity. In comparing costs, however, loss of productivity to the existing method of transport due to either of the causes stated below must be set against the new investment:

- a) if that part of the invested capital which has not yet been depreciated becomes valueless because there is no further demand for its services; or
- b) if insufficient use is now made of available capacity so that fixed costs cannot be covered at tariff rates which are held down by competition.

Waterway services become economic when the income derived fully compensates for the economic expenditure incurred. This means that in addition to covering out of pocket expenses for maintenance and operation, a proper amount is also coming in for renewal of capital. On the other hand, there are basic reasons why the invested capital should not be amortised because this would mean, in the long term, that the users of the canal would become its owners. In addition, interest would cease to fulfil its function of regulating capital, although this is essential for the co-ordination of traffic.

An artificial waterway can be used in return for a previously established fee, the amount of which does

not depend on the density of traffic. If dues are kept at the same level, total takings are dependent only upon the density of traffic and the canal operation becomes economic when such takings cover total costs. With the considerable minimum capacity and developing traffic functions of a new canal it is quite possible that initially, even if its use is free of charge, full capacity will not be achieved and that the canal will be unable to function economically on the basis of any feasible charge. If dues are established on the basis of average costs when the canal is working to capacity, it is possible, in some cases, to achieve economic working by means of suitable subsidiary effects. Even if this is not the case, canals may be justified in working at a loss where increasing economic growth means that the necessary density of traffic will be reached within a foreseeable period.

The relatively easily calculated criterion of economic operation plays an important role in present-day transport policy. The last few years have offered a plethora of examples and the results of discussions on transport policy have resulted—inter alia—in a construction programme which embraces the Nordsüdkanal. Investment cost estimates, which are the basis for economic evaluation, have been made more than once and their results—which are important not least for the localities situated on the canal—can give considerable support to our remarks.<sup>1</sup> So the decisive factor for the extent of public investment in communications is not only the desire for an efficient canal; the economic advantages of a new combination of production factors are also important.

#### The Role in Communications of the North-South Canal

If we relate the above outline to the waterways of West Germany, it can be seen that the existing network—in reality, it is less a network than a linking up of large rivers—cannot completely fulfil all the functions required of it. Rotterdam is connected with the West German industrial area by the most important waterway in Western Europe—the Rhine. Emden is connected with the Eastern Ruhr by the Dortmund-Ems Canal. The canalisation of the Weser from the Midland Canal as far as Bremen has been completed. Only Hamburg and the Baltic port of Lübeck have no efficient connection with the Western German canal system.

As soon as such a connection has been realised all important traffic requirements in the West German area will be met by artificial or natural inland waterways. Plans were drawn up years ago to give the Port of Hamburg a more attractive waterway for a better development of its hinterland. The fact that the Central Elbe was connected to the Midland Canal shows that the improvement of the former also played a role in these plans. However, the detour which this route would entail is so long that even if it cut out the

<sup>1</sup> On this subject, see articles published by the Institut für Verkehrswirtschaft, University of Münster, in particular R. F u n c k ; H. D u r g e l o h , "Die volkswirtschaftliche Beurteilung des Baues künstlicher Wasserstraßen—insbesondere des Nordsüdkanals" (An economic Evaluation of the Construction of Artificial Waterways—in particular the North-South Canal), Vol. 27 of the series, Göttingen 1962.

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considerable obstacles to shipping on the Central Elbe, high transport costs would be insuperable vis-à-vis a shorter and more direct route, and plans to construct a new canal finally hardened into the Nordsüdkanal project. The advantage of this project is that it combines three communication functions:

- the functions of an Elbe lateral canal;
- a connective function for the Lower Saxony industrial region;
- a connective function with the Rhine/Westphalia industrial region.

There are many deficiencies in communications between the ports at the mouth of the Elbe, Hamburg and Lübeck—via the Elbe-Lübeck Canal, which was constructed at the turn of the century—with their hinterland. Ignoring the political division, there is still a quite considerable deficiency which always works to the disadvantage of the location: the very frequent acutely low level of water in the Central Elbe. To construct an artificial waterway merely because of this political division is an example of the short-term planning of long-term projects. Naturally, after reunification the significance of such a canal would increase from the communications aspect. For the time being it is impossible to overcome the difficulties in the way of eliminating the problem of the low water-level. But—if we accept the estimates of the hydro-technologists—even should this become feasible at a later date, costings show that it would still be better to construct a canal.

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In former years, Hamburg's hinterland was determined by the Elbe and the waterways in Central and Eastern Germany with which it was connected. Statistics show that before political division took place, more than half the goods trans-shipped in Hamburg were transported via the Elbe waterways in trade with the hinterland. Even if this hinterland had remained, there would still have been some post-war shifts in the flow of goods, for even inland shipping has been rationalised and the tendency towards larger motorised ships and all those other developments which are typical of current production also apply to modern inland shipping. Thus the question of regulating the Central Elbe would still have had to be solved in the long term. Over the last hundred years works undertaken to achieve better river regulation have improved the waterway considerably, but it is by no means adequate to satisfy the present-day requirements of modern shipping.

On the other hand, the new canal fulfils all the requirements without which it is impossible for present-day inland shipping to become an efficient means of transport. In communications with the West it shortens transport distances and circulation; it thus makes a contribution to decreasing running costs, dues and charges. The Elbe is still there as an additional waterway. In times of sufficient flow of water it can be the regulator of competition. The distance Berlin/Hamburg is a somewhat longer stretch (47 canal kilometers), the

kilometer disadvantage will be balanced by the Nord-südkanal's cost advantages.

### The Importance of the Canal in Encouraging Industry

When the Nordsüdkanal is built, the industrial region of Braunschweig/Hannover will gain an efficient waterway to the seaports and the canal will thus fulfil a second important communication function. Hamburg and Lübeck, on the other hand, will find that their trans-shipment facilities will gain in attraction for a region which, compared with the Ruhr—particularly because of its political division—has to accept certain (locational) disadvantages. The reason why the canal can only in the long term enter fully into its functions is because of the growth potential of the Lower Saxony region. Certain conversion processes in manufacturing techniques lead us to believe that the importance of sea ports for the inflow and outflow of goods is growing. Additionally, the canal can make a contribution to the industrial development of the region and this, in turn, will react positively upon the demand for trans-shipment services.

We must not forget that the industrial area of the Braunschweig/Hannover region has a peripheral nucleus of heavy industry and that the flow of goods from this centre, with its forward position vis-à-vis the Ruhr, will have a decisive influence not least upon the demand for transport. Besides potash, the goods traditionally carried by inland waterway to the Elbe seaports are products of non-metallic minerals industry, salts and products of the heavy industry in the Hannover, Hildesheim and Braunschweig regions, whilst fodder, fuels and industrial raw materials should be on the receiving end. These loads will not mean that the canal is working to capacity, but the new route will be of the greatest importance in helping to open up the hinterland of the Port of Hamburg to traffic and thus in improving its locational position.

An efficient mode of communication between the ports at the mouth of the Elbe and the Ruhr will eliminate one of the locational disadvantages for these ports—which is particularly serious for Hamburg and those ports with a similar geographical position as long as Germany is politically divided. Because of the Rhine, the Rhine/Ruhr industry looks mainly to Benelux ports—to the dismay of the German North Sea ports. In order to start off on equal conditions it would be necessary to extend their "catchment area". This certainly does not mean relocating large quantities of transport. If important industrial areas in Germany could make use of ports at the mouth of the Elbe on reasonable terms, this would certainly make for a more stable level of transshipment business. Coal will be the most important seaward-travelling item. The traffic to the Ruhr will deal mainly with the dispatch from seaports of imported industrial raw materials, foodstuffs and manufactured goods and the dispatch of processed agricultural products from Schleswig-Holstein. Since these goods are shipped only in small loads, inland waterways will be of only minor importance for their transport. The position will be different

for timber, grain, petro-chemical products and, possibly, for iron ores, since with the new route the lop-sided dependence of the Ruhr upon the Benelux ports could be broken down, to the advantage of the ports at the mouth of the Elbe. This would mean that Hamburg would no longer be left in its present peripheral position.

It is not for us to say what quantities of goods will be transported by the new canal or when the new

canal will be able to assume a fully economic function. Detailed studies—which the author has collaborated—have already been made of these points. But the inclusion of the project in the plan to extend North West Germany's canal system points up the urgency of extending the communication network. This means that the competitiveness of the Port of Hamburg vis-à-vis the North-West European seaports will be greatly increased.

## World Business Trends

*Department for Business Trends Research,  
The Hamburg Institute for International Economics*

### *Investment in West Europe Increasing only Slowly*

If the growth of the West European national product in the current year can be estimated at approx. 3,5% at constant prices according to the present data, this means a further slight decrease of the growth rate as compared with the previous year. Thus former expectations were disappointed, which were rather anticipating a slight acceleration. Regionally seen the decisive factor for this were the distinct retarding forces not expected in their strength in the Federal Republic of Germany and the United Kingdom. From another point of view, namely seen from expenditure, investment proves obviously to be a relatively weak point.

Granted, especially this aggregate shows particularly great deficiencies of short-term statistical registration in international comparison. But the present estimates make suppose that investments in West Europe will only increase to the same extent as the national product, that is by approx. 3,5% at constant prices—somewhat less than in the previous year. So the expansive forces expected because of a changing tendency in this field have not materialised. Here completely different single factors act together which are not only the result of the regional differentiation of the economic trend in West Europe, but also above all of the different motives for private and public investment.

Among the most important West European economies the two biggest, namely the Federal Republic of Germany and the United Kingdom, at present are marked by a strong decline of their investment activity. So in 1966 investment in the FR of Germany will grow less than half as rapidly as in the previous year. Here above all the decline is a result of the decreased investment propensity of entrepreneurs. This applies equally to the United Kingdom, where the total investment activity in 1966 will probably hardly exceed the last year's volume, although the corresponding expenses of public industries and services are still constantly growing.

With an estimated real growth of 5 and 4%, respectively, in France and Italy the increase of investments in the current year is greater. The expansion in this field in the two countries compared with the increases in total production, is still dull. But a detailed observation gives an explanation. Thus in France the acceleration of the investment growth in business enterprises, especially in private ones, is really remarkable. Simultaneously, however, housing has brought dampening influences. Similar tendencies are prevalent in Italy, where at the same time the annual result of public investment shows a downward tendency.

It is remarkable that the investment volume in Italy in the current year is still by 10% smaller than in 1963, whereas, the national product has risen by more than 11% since then; consequently the overall investment rate fell from more than 24% to 20% of national output. In industry alone the divergence between investment and production development is yet more distinct; at any rate, total equipment investments in 1966 are supposed to remain below the volume of 1963 by even more than 20%. On the one hand this shows how great the unutilised capacities of the Italian economy were at the beginning of the present expansion phase. On the other, profits and profit expectations—the latter perhaps due to anxieties concerning international policy—had been depressed so considerably that only a very effective improvement of the sales and profit situation may bring the investment propensity up to its former height.

According to the presently recognisable tendencies in the year to come the differentiation of investment activity in the most important West European economies will still increase. On the one hand investment in France and Italy is likely to increase by 7 to 8% in volume. Acceleration will start in the private field, where improved income expectations become effective, as well as in the public sector, where the urgency of the so-called