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COSTS OF TRANSPORT SERVICES AND THEIR SIGNIFICANCE

ABSTRACT

Transport costs in certain branches of transport are very different. When they are compared, it is necessary to consider all the factors influencing them, and to compare the (same) qualities for different branches of transport. They may be analysed from three aspects:

a) from the aspect of the carrier,

b) from the aspect of the transportation service user,

c) from the aspect of society.

With the rationalisation of production and optimisation of location, as well as production activities related to transport, the volume of transport is influenced, in relation to the volume of production, i.e. to the transport coefficient, thus influencing also the transportation costs in all branches of transport. Besides, the key factors influencing transportation costs include: duration of transport, distribution of transport among carriers regarding their costs and price (general level of transportation prices).

KEY WORDS

transportation costs, resources, allocation, cost of structure, economic cost, replacement cost, costs of transport mode

1. INTRODUCTION

The notion of *cost* belongs without any doubt among the basic notions in the economic, and therefore also the traffic system. They are significant even when the business results are not involved in costs. Considered from the point of view of long-term operation of a company (providing services), it would be difficult to imagine that they have a sporadic role. Therefore, this phenomenon was similarly important both for the small as for the big companies. However, even in small companies (traffic units) as they might be called, costs play a significant role regarding business activities and survival.

Their function marks the relation between the costs in a certain monetary (value) unit and the volume of production (traffic), expressed in the number of products or services.

The costs of transport services belong to the group of additional transportation costs. They are added to the value of the transported goods and they increase this value, unlike pure transportation costs that are not added to the value, they are left out, and covered out of the goods value.

Transportation service causes costs of materialised and living labour, so that the value of transport service consists also of the same factors as well as the value of every other product. That is, from the transferred part of the value of production means (fixed capital in capitalism) and from the value of living labour (variable capital), as well as from the surplus labour, i.e. surplus value. This value is expressed by the formula:

$$K = C + V + M$$

where:

C – is the transferred part of the value,

K, M – newly created values.

When designing the values of transportation services, there are certain specific features stipulated by the production in traffic, compared to those in industry. The specific characteristics mean that in the transportation process, the values of the objects of work – goods transported in its basic activity (except when the carrier has to compensate for the damage on the transported goods), are not included in the value of the transportation service – product. Neither does the value of transportation service then depend on the value of objects of work – goods that are transported. The transportation process results in certain costs: fuel, lubricant, fuel of the secondary material, spare parts, etc. necessary for maintenance.

2. STRUCTURE OF TRANSPORT COSTS

The structure of transportation costs marks the typical way in which the total costs or expenditure of

this form of transport is divided into variable, fixed costs and interest demand.[1] In the context of this paper, a more detailed subdivision of the total cost can be made, but for our needs this triple classification is sufficient.

The function of costs denotes the relation between the costs (expressed in some monetary unit), and the volume of production (expressed in the number of products, i.e. services). Total costs of a product or service can be divided into two parts:

a) average constant costs, that have to fall constantly with the rise in traffic, and

b) average variable costs.

All other costs divided with the total number of produced – transported units, that may fall, remain unchanged or rise with the increase of traffic (production).

The change rate of variable costs is called marginal cost. Over a certain long term, when the volume of traffic can vary on its own accord, all costs become variable, and the previous division into constant and variable costs becomes pointless.[2]

The flow of transportation costs per branches of traffic according to transport distances is presented in Figure 1. (Source: Stubbs)[3]

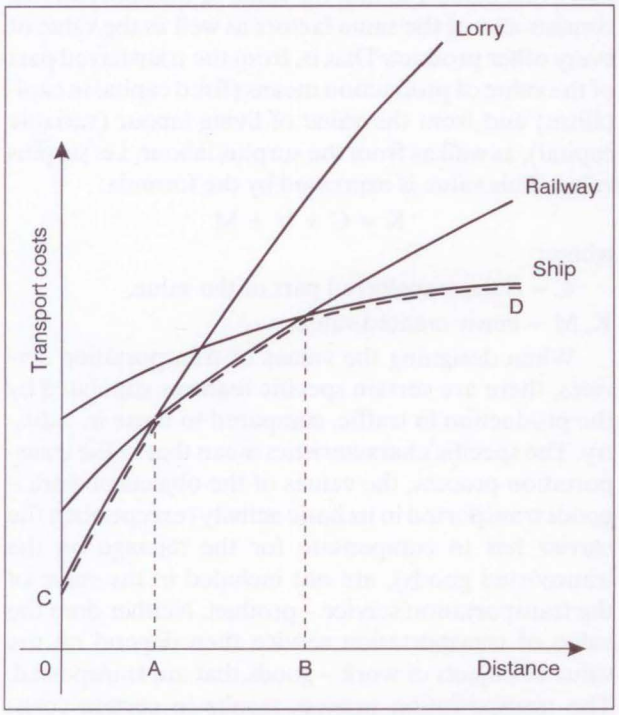

Figure 1 - Flow of transportation costs per branches of traffic according to transportation distance

Source: Stubbs

Transport costs in certain branches of transport are very different. When compared, it is necessary to consider all the factors that influence them, and compare their (equal) advantages for certain traffic branches.

Such costs can be regarded from the three different aspects, and they are:

a) from the carrier's aspect

b) from the transportation service user aspect, and

c) from the aspect of the society.

As an example, one can mention the costs of the carrier – producer of transportation services, which are lower than the service selling price, since transport services include also a relative share in the surplus value.

There are also certain differences regarding certain branches of traffic regarding additional operations (such as e.g. expenditures for loading, delivery and dispatch of the goods to the loading place, i.e. unloading). The lowest additional costs are in road traffic, due to certain adaptability – door-to-door delivery.

On the other hand, it is often being emphasised that railways have an advantage over the road transport in that road transport does not have to cover full costs of motorways, on which the services of road transport depend. There are sometimes two main arguments for such a concept: the first one is that the initial cost of motorway is inadequately small, since it was not needed in the construction of roads, preparing of the land as well as of other infrastructure, as for example in the case of constructing a constant path for railways, and second, that the motorway cost has resulted from charges and that as a result, the used finances do not include any interest taxes. Regarding the first case (argument), it is likely that many existing motorways were built on the already built roads, that had been used, before the appearance of motor traffic, and that the cost of acquiring land was low compared to the costs of land at the time of railway construction.

Practical difficulties in allocating transportation costs for the product (service) differ in nature and scope with different forms of transport. Such differences are technical in nature. In railway transport, the transport unit can consist of a different number of cargo units, which is the main complication that is missing in road transport where these two units are usually identical. Furthermore, railway transport moves transport in great volumes, and road transport in much smaller volumes. One train can carry a load that would need a hundred lorries in road transport.

The problem of indivisibility is much greater in railway than in road transport. The amount of costs that are common to various traffic branches is greater in railway than in road transport. Many railway resources e.g. serve both in passenger and cargo traffic. In road traffic, except for the motorway, the resources tend to be used either for passengers or for cargo. Whereas theoretically it is possible to allocate joint

costs, at least for the total (regarding quality different) traffic in practice these costs are extremely difficult to divide. Finally, in railway, there is a greater amount of what may be called "internal purchase", due to railway organisation of a wide scope. As result, a system is needed of internal calculation so as to arrive to certain costs, costs that are in case of road transport societies of smaller scope, obtained by means of payments given to external suppliers.[4]

At one time, the attitude was accepted that it was impossible to determine the railway costs of movement of special volumes of traffic. When the railways had the real monopoly over internal transport, there was less need for determining special costs for special services. With the development of other branches of traffic, the need to determine the cost of special railway services became important. As noted, the cost insures the basis for transport co-ordination.

If it is in fact impossible to confirm the costs of special services, then there is no economic way of co-ordinating railway transport with other transport means. However, such extreme attitude is not advocated today any more.[5]

Although difficulties are relatively big today, it has now been accepted that it is possible to determine special railway costs of carrying special types of traffic (and of operation of special types of services).[6]

We could stress that the total costs of carrying large integral transports, e.g. total costs of railway traffic of a certain country, are economically less important than the special costs of special volumes of traffic within a large whole. Decisions made regarding supply of transport means are related to special costs of special amounts of products, rather than to total production costs. One may assume that the costs of supply of total transport services by rail are smaller than the total supply costs of the same services by road. Such a comparison of total costs may expertly hide the fact that special services within a whole can act more economically by road than by rail.

Therefore, any quantitative division of total costs between two categories of fixed and variable ones must be relative for a given scope of carried traffic. That is, ratio of the fixed and variable costs will change of its own accord with the change in traffic volume. After obtaining the scope of work of railway services, the ratio between the fixed and variable costs in railway traffic is 50%:50%.

As reaction to the increased demand, the volume of rail services increases as well. At the same time, there will be an increase in variable costs (an increase that may be proportional or more than proportional to the increase in services). If it is assumed that the increase in traffic can be satisfied by more intensive use of the existing fixed resources, the relation between fixed and variable costs will change. In the new situation the relation between costs will be less than 50% of the fixed and more than 50% of variable costs.[7]

The range of capacities of the existing fixed resources and the extent to which they can be used must be taken into account. One form of transport can have a cost ratio of up to 80% fixed to 20% variable costs, regarding traffic it carries, and the other form of transport can have the costs ratio of 20% fixed to 80% variable, which means relative to the scope of transferred traffic.

However, small increase in traffic, in the former case, can lead to great increase in the total cost, if the existing fixed resources are greater in the use of total capacity. In the case of the latter, great increase in traffic can be met without increasing the fixed costs, since the existing fixed resources have a great reserve of "spare" capacity. In other words, a great ratio of fixed to variable costs does not have to indicate the ease with which the additional traffic can be satisfied.

Or if considered in a different way, the lack of variability in fixed costs with regard to change in traffic volume can be applied only in case of small increase in its volume. The important thing is whether the existing resources do or do not have the "spare" capacity.

Here we can note that "spare" capacity can result in two different ways. The first one is, that the fixed resource as technical necessity has to be delivered by the wide range of technical capacity. The second is, that where the fixed resource has the wide range of technical capacity, there is the resource result set for the production of high level of product, and it is not justified any more by the existing level of demand. To provide an example for the first case, the introduction of air service can require landing infrastructure, that would satisfy numerous aircraft operations greater than the number necessary for the operation of air service.

Additional air services would then be possible without change in fixed costs, as long as this infrastructure is considered. Similarly, with the introduction of rail service between two points that require the construction of a line with a certificate for traffic density greater than initially asked for. One line will have "spare" capacity as a matter of technical need, and the other would represent the minimum capacity of railway means that should be organised.

In the latter circumstance, the fall in traffic will cause the existing (fixed) resource to be (possibly) replaced by a fixed resource of smaller capacity, and the fixed cost related to lower traffic volume that is (smaller) spare cost of the spare resource of smaller capacity. In these circumstances, the fall in traffic will be accompanied by the reduction of both variable and fixed costs (the latter was calculated in the form of spare cost) and the ratio of fixed to variable costs would not have to change a lot.

The cost of rail transport structure is often compared to road, based on the fact that in rail transport a significant volume of total costs has by nature a fixed tendency, whereas in road transport only a small part belongs to the fixed category. Therefore, it may be concluded that road traffic can transfer increased traffic only with proportional, or more than proportional increase of total cost (resulting in the cost per unit which falls as the increased traffic is transferred).

Before coming to any conclusions, one should know the following: first, whether all the resources are necessary, regarding every type of transport, i.e. all the resources whose use imposes economic cost, and whether they are included in the comparison of costs; second, whether the interest is included in the fixed costs; third, whether fixed costs include costs that are variable and that are conventionally in practice considered as fixed; and finally, whether fixed used resources have the capacity "reserve" which will, regarding technical reasons, and regardless of any fall in demand, if imposed, require the replacement of the existing capacity, when fixed resources require reconstruction.

Assuming that the variable and fixed costs have been evaluated, in accordance with the economic definition of these conditions, the relation of the total rail costs, which are fixed, can be less significant than popularly assumed. On the other hand, whatever the said share, it is not sufficient to satisfy the increase in rail traffic without additional fixed costs. It may, therefore, not be assumed that greater increase in traffic can be accepted by the railway with less engagement of proportional in the total costs.

Also, the fact cannot be neglected that in special circumstances the increased rail traffic could match a minor increase in costs. For instance, not all the trains carry total (maximum) loads. Since railway has greater loading capacity than a road vehicle – and, generally speaking rail transport uses resources which are indivisible, unlike those used in road transport. However, it is possible that at special times and on special routes additional traffic can occur, without adding special cars, whereas in road traffic, the very additional traffic could cause additional rides. Furthermore, if rail services are offered which should satisfy the peak traffic demands, there will be "spare" capacity in off-peak periods, or the one that can be used to carry additional traffic, with relative increase in the total cost.

However, the problem of using "spare" capacity caused by the indivisibility and peak traffic requirement is one thing, and the problem of purchase of the total increase in traffic, another.[8]

The demand for transportation services changes constantly, both regarding quality and quantity, new production techniques are being constantly developed. The resource – prices can be changed, allowing for the need to substitute one raw material for another.

It may become economical, e.g. to replace oil for petrol, as a fuel in road transport. On the other hand, the more durable (economical) the resource, the less it has to be replaced, and vice versa, the less durable it is, the more often will it have to be replaced.

Road transport is a type of traffic which uses a greater amount of durable resources less often, since many resources used in this branch of traffic are replaced relatively quickly. Rail transport, however, uses resources that are replaced after relatively long periods of service. Rail transport cannot adapt its production capacities according to the changes in external circumstances so quickly as can road traffic.

Many used resources in air transport are durable, similar to those in air terminals, since the demand for air traffic is growing.

The used resources in water transport are very durable, but since the demand for canal transport is a subject of continuous fall, there is little possibility for technical improvements. Regarding road and rail transport, the former has the advantage not only regarding low level of resource durability it uses, on the other hand it is a rapidly expanding industry. There is a need to increase the durable resources, that enable new discoveries and innovations in production arrangements, that are used more optimally in external situations. The expansion level of the demand for the rail transport means is of a more modest nature.

3. CHARACTERISTICS OF ECONOMIC COSTS

Up to now we were looking at the cost of transportation service supply as if it were an amount of resources necessary for traffic supply of the given service. Clearly put, when we speak of costs, we have to use the terms of values, rather than physical quantities. The use of a small amount of high value resources for instance, may be more expensive than the use of a great amount of lower value resources. Therefore, the term cost has to be explained from the economic aspect.

One fact is clear, that the profitable resources are rare compared to all their other uses. Their uses can be direct or indirect production of consumers' goods and services. This is because potential demand for consumers' goods and services exceeds what available supply of resources can produce, in order for them to have value, naturally such that is contained in any resource, which reflects on the one hand interaction of supply availability and, on the other hand intensity of demand for these services. If measured, e.g. in money, the said values also represent value in money. Thus the price of resource per its unit, price of

coal per tonne, e.g. price of petrol per gallon, represent their level of value. A resource which is hard to purchase, and the demand is great, will have a higher value per unit, and the one with greater supply and lower demand, will have a low price per resource unit.

That a resource is rare regarding its use, means not only that it has value, but also that its usage, through a certain utilisation provides economic cost.

The essence of the concept of economic cost, as applied to the use of resources, is that something has to be adopted as the result of using the resource, with the aim of producing a certain kind of product (offered services). If something is not adopted, or if you can eat your cake and still have it, then no economic cost has been produced.[9]

In order to explain the cost of transportation service, we have to question ourselves: Which alternative products should the used resources offer for the transportation service to produce them, if it is not provided? This question could be answered in physical terms, listing all the mentioned alternative products as result of the transportation service offer. However, such a procedure would not only be very ungainly, it would, in fact, have little sense, because it would provide no possibility for any comparison. Therefore, the question has to be answered in the terms of value. The values of previous alternative products, by insuring transportation services, must be summed up in order to obtain total – cumulative sum, which can then be taken as cost of the transportation service, expressed in monetary value. Methods of estimating economic cost can be regarded through payments of resources that have been used in providing the transportation service or, they indicate its potential surplus of value to alternative products.

The concept of economic cost is explained through the purchase of fuel, cost of driving personnel and vehicles, and other similar expenditures, that arise from the transportation service.

Resources needed by certain carriers, in order to perform their service will have alternative use. Petrol e.g. can be used in cars, but, also in chemistry, in lighting, etc. Therefore, the alternative use of power sources is obvious from other uses as well.

It is similar with prices. Prices that carriers have to pay for the used resources, reflect the power of competitive requirements constituted from other uses of these resources. The price of resource used in supplying a certain transportation service shows the value of alternative products, which the resource can produce, or contribution of value to other products, which a resource could supply if it were not used in the transportation service supply.

The aim of transport is then to reduce the gap between the producer and the consumer, and the gap is measured in economic terms (costs). We can, therefore, say that the task of transport is to supply means that will span the gap between the producer and the consumer with the lowest economic cost for the community, and also with the lowest possible "denial" of other goods and services.

4. CO-ORDINATION OF TRANSPORT REGARDING COSTS

The term *"co-ordination"* can be used in physical or economic aspect. In the physical sense it refers to the establishment of traffic services connections or introduction of combined arrangements of operation, transit tickets offer, etc. under the conditions in which people use various transportation services and means.

Introduction and development of every new mode of transport is accompanied not only by the increase in the total demand, but also by a re-distribution of the existing transportation demand in favour of the more modern transportation mode. The re-distribution effect consists in abandoning the older transport modes with spare capacity. Since older forms use resources of high durability, it is impossible to abandon such capacity with the result of the total supply of transportation modes overemphasised in relation to the total demand.[10]

Therefore, it is necessary to insure that the development of modern transportation means is not disturbed (neglected), when these are more economical than the old ones. It is impossible then to claim that (regarding a certain distance) road would be more economical than rail, and in other circumstances that rail would have advantages over road.

By using a simplified illustration let us assume that the cost applied for maintaining of certain traffic means on a certain route would amount to 1,000 Kunas weekly by rail, and in road transport e.g. it would amount to 1,500 Kunas. We may also assume that the quality of service offered by road and railway is the same, and the given costs are economic for both modes of transport.

The use of railway will reduce the number of victims, and also enable safer arrival to a certain destination.

Should we assume that additional cost is applied, which is not economic, to the railway economic cost of 1,000 Kunas weekly, the surplus means e.g. depreciation based on the original cost of the main resource, which will not be renewed, that is, a balance will be established between the economic advantage of the railway compared to road.

By adding this cost, which is not economic, the railway "cost" is increased to 2,000 Kunas. Thus it would seem that road is cheaper than railway, although eco-

nomically speaking, the railway is a little cheaper than road. When, in such circumstances, traffic moves along the road rather than along the tracks, 500 Kunas worth of goods and services would be unnecessarily denied, and the community would be unnecessarily poorer for that amount. If we assumed that the railway cost of movement of a certain volume of passenger traffic over a period of time amounted to 500 Kunas, the estimated cost of movement of this same traffic by air would amount to 700 Kunas. If the estimated figures reflect relative economic costs, it may be concluded that for that case air transport is cheaper. For the conclusion to be relevant, the compilation of railway cost must not include the initial cost for resources, inherited from before, and must include the replacement cost, especially if those resources that continue to offer railway services will require replacement.

On the other hand, if air service is a new project, which requires construction of runways and terminals, the costs of the equipment and facilities have to be included in the estimated cost of the planned air service. The construction of the said facilities will require the use of several allocated resources, that could be placed into other profitable uses.

The aim that we are trying to achieve by co-ordination of transport is sometimes defined as if insuring various forms of transport, instead of competing mutually, offering complementary services.

Considerations about economic costs suggest that the proposal has the following economic meaning. Where any service by different modes of transport can be offered, the mode of transport supplying the service has to be the one that, allowing for the differences in the service quality, meets the transport demand at the lowest economic cost, which is, in fact the aim of the economic and traffic policy.

5. CHARACTERISTICS OF TRANSPORT COSTS WITH REGARD TO BEHAVIOUR DYNAMICS

Considering the structure of transportation costs globally, it may be noted that fixed component prevails over the variable component, caused by the nature of the operation, as well as by the structure of the basic material substance of the traffic activity. In the structure of the basic material substance of this industry dominates, as known, the infrastructure, which includes fixed plants and facilities such as: roads and rail tracks, constructed and regulated waterways, traffic terminals and junctions with accompanying equipment, ports and harbours (maritime and air) etc. When high value mobile transportation means are added (buses, lorries, locomotives and cars, vessels, aircraft), then the result are the fixed costs (depreciation, maintenance, insurance) for the reproduction of the total mass of these means.

Therefore, certain traffic branches, such as e.g. railway, in the structure of their total costs, can have a share of fixed components amounting to 60-80%, depending on the transport volume.

Such high share of the fixed component in the total costs leads to a very small dynamics, i.e. slowed down flow of total costs, and this phenomenon is called costs remanence. Understandably this phenomenon acts also in the phase of transportation increase, as well as in the phase of decrease. However, in the phase of traffic increase, it has much better implications than in the phase of decrease. In the phase of traffic increase, and this also means of aliquot increase of revenues, the costs remanence results in their lagging behind the transport increase and revenues increase, which in turn means making profit, i.e. positive business re-

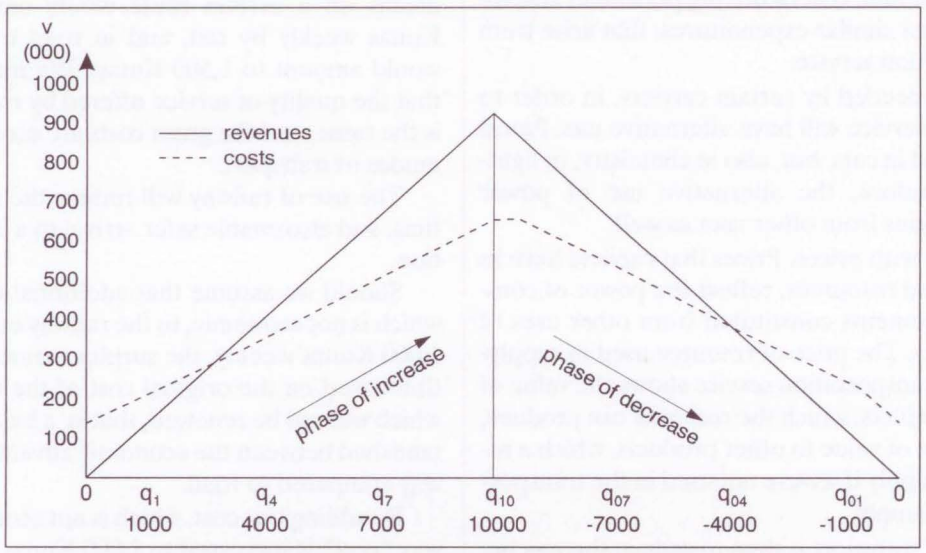

Figure 2 - Relation between revenues and remanence of costs

sults. The same phenomenon, that is remanence, during the phase of transport decrease results in even slower costs decrease, so that depending on the decrease rate of traffic and revenues, this usually has adverse effect on costs and revenues.

Such situation, i.e. implications of the phenomenon of costs remanence can be well observed in the schematic presentation in Figure 2.

Except for the substantially slower (remanent) flow of costs (in both phases) than flow of revenues, the Figure shows at the beginning of the phase of transport (revenues) decrease certain period of costs stagnation[11], caused by inertia, i.e. by slow adaptation of costs to the falling tendency of transport. This lack of costs elasticity is explained by strong influence of the fixed component, i.e. by the indivisibility of single cost segments, which are otherwise regarded as variable costs.

The described phenomenon of costs remanence is less expressed in those traffic branches where the infrastructure is neither regarding organisation nor ownership included in the structure of the related branches – traffic carriers, as is the case with road traffic. Then, the costs of infrastructure are covered in another way (through the fuel price), and usually in a smaller amount, so that the fixed component of costs is lower.

Otherwise, the phenomenon of costs remanence can be best offset by making the most use of it in adapting the traffic volume, i.e. by stimulation of the increase and preventing the falling tendency of traffic, as well as by the price of introducing commercial and other benefits.

6. CHARACTERISTICS OF TRANSPORT COSTS WITH REGARD TO THEIR COVERAGE, i.e. PAYMENT

The very premise indicates a certain doubt regarding transportation costs from the aspect of their boundary determination and scope, i.e. it shows that it is not an unambiguous and homogeneous category. First of all, regarding aspect, transport costs can be regarded as:

- transport carriers, i.e. transport service performers,
- direct transport service users, and
- society, i.e. government.

Speaking of transport carriers, it should be mentioned that in the existing circumstances of free and deregulated market, there are many more now than previously, with regard to the expansion of private initiatives. Numerous private, either individual or shareholder carriers joined other subjects of this industry, carrier societies and organisations and carrier subjects – units on the principle of "for personal needs". Having this in mind, one might say that there are no monopolistic carriers on the transportation market, so that this should suffice regarding the level of transport prices.

In other words, transport carriers are forced to maximally rationalise transport costs, including in the transport price only the actually carried out work and services, so as to insure the demand for their services on the one hand, and to maintain the reproduction of their operation on the other. Regardless of the way in which transport carriers treat transport costs (as: costs or expenditure of operation, costs of simple reproduction, cost price of the transport service), what is important is their scope in the sense of including the external costs. These are costs for environmental protection from noise, air, water and nature pollution, as well asfrom any other form of environment degradation, covered to a great extent by the notion of ecological costs.

It is precisely these costs that are increasingly occurring as a factor of cost, price and quality differences among numerous transport carriers, questioning the survival on the transportation market under the integration conditions and this ecological factor.

From the aspect of direct transport service user, transport costs represent the price paid to the transport carrier for the carried out transportation service. For the transport carrier this is the selling price of the service resulting in the business return, whereas for the service user it is an expenditure as all the other expenditure items.

However, the question here refers to the content and scope of the service paid by the transport user to the transport carrier, since not everything is always clear here of its own accord, and there is a wider and a narrower notion of scope for the transportation service. The narrower notion, namely, most often includes only the price of transport from the departure to the destination point, without various additional services, which complete and improve the transportation service. The additional services include e.g.[12] packaging, designating, concentration and storage in the carriers' storehouses, loading and unloading, delivery and dispatch, from and to the users' storehouses, etc.

If some of the mentioned services are not included in the basic transport price, the user has to cover them separately, and only such completed expenditures represent transport costs from the aspect of the transport user.

It has to be mentioned here, that the amount of additional transport expenditures is greater in those traffic branches that do not have the technical elasticity of transport, i.e. fewer possibilities of providing direct delivery of goods. Some data are mentioned in that sense, about the relations between the basic and addi-

tional mass of transport expenditures for single traffic branches.

Table 1

Traffic branch	Freight %	Additional freight %
1	2	3
road traffic	80	20
railway traffic	66	34
river traffic	58	42

Source: Jelinović, Z.: Ekonomika prometa i pomorstva, Zagreb, Informator, 1983, p. 3

It may be also mentioned in the same context that e.g. in transport of piece goods shipment, railway provides higher level of services than in wagon shipments, since piece goods are concentrated and stored at railway storehouses, and railway carries out the loading and unloading, whereas in wagon shipments this is done by the transport user himself. Therefore, as well as due to the smaller i.e. fragmented mass of piece shipments, the railway tariff for their transport is higher than for the wagon shipments, even up to three times.

Regarding the level, transport costs are in fact the greatest; apart from the previous level, i.e. costs from the users' aspect, they include also various government subventions, subsidies and compensations, as well as expenditures for infrastructure in the majority of traffic branches. Although these forms of government's prerogatives to the transport industry are decreasing constantly in favour of market mechanisms, the supportive influence of the government in the segment of infrastructure is till quite marked.

However, the most part of external, i.e. ecological costs of traffic industry is still at the level, that is charging the society. Such expenditures (for ecological protection) are being very slowly accepted by the transport carriers for the costs of their reproduction, because this makes their services more expensive and less competitive.

Certainly, the presented forms of charging, i.e. expenditures for the traffic activities are quite significant, but it is very difficult to quantify them precisely. First of all, because they appear very extensively, that is in numerous places, and appear in various ways.

No doubt, however, they too represent costs, that need to be at least approximately evaluated and taken into consideration as a factor charging the price of effects – products – goods – services.

7. CONCLUSION

The essence of transport costs treated in this work result, in fact, from the general and universal significance of traffic industry, which pervades and enables reproduction of the social and economic structure through all the four known phases of the transport process.

They belong to the group of additional transport costs. They are added to the value of the transported goods and they increase it, unlike pure transport costs that are not added to the goods value, they are left out, and covered out of the goods value.

The expenditure of materialised and living labour result during the transportation activity (service), and thus the value of transportation service consists of the same factors as the value of any other product, that is, from the transferred share of the value of production means (fixed capital) and of the value of direct labour (variable capital), and of surplus value expressed by the formula:

$$K = C + V + M.$$

The cost structure of the transportation form indicates the typical manner in which the total cost – expenditure of this form of transport is divided between variable, fixed costs and interest demand.

Their function marks the relation between the costs (expressed in a monetary unit) and the volume of production (expressed in the number of products or services).

The essence of the concept of economic cost, as applied in the use of resources, is that something has to be adopted as result of resource usage with the aim of producing a certain kind of product (offered services). If something is not adopted, or "if you can eat your cake and still have it", then you have not produced any economic cost.

Or, "I cannot afford a taxi, it is too expensive" – meaning in fact that I do not have enough money or income to pay for a taxi ride. However, I do not want to do it because I prefer other things. The taxi fare is something that precedes other things and therefore I consider this expenditure too high.

Similar situations occur with the usage of rare profitable resources. Therefore, the cost of using a resource unit is presented by what preceded regarding other things that might be produced through the most valuable alternative use.

SAŽETAK

TROŠKOVI TRANSPORTNIH USLUGA I NJIHOVO ZNAČENJE

Troškovi prijevoza u pojedinim granama prometa vrlo su različiti. U njihovoj komparaciji nužno je sagledati sve činitelje koji na njih utječu, pa uspoređivati (jednake) kvalitete za različite grane prometa.

Možemo ih promatrati s triju različitih motrišta, i to:

a) s motrišta troškova prijevoznika,

b) korisnika prijevoznih usluga, i

c) s motrišta društvene zajednice.

S racionalizacijom proizvodnje i optimiranjem lokacije, te proizvodnih aktivnosti glede transporta, utječe se na količinu prijevoza u odnosu na količinu proizvodnje, tj. na transportni koeficijent, a time i na transportne troškove u svim granama prometa.

Pored toga, bitni utjecajni čimbenici na transportne troškove su: duljina prijevoza, raspodjela prijevoza po nositeljima s obzirom na njihove troškove i cijene (opća razina prijevoznih cijena).

NOTES

1. The terms variable and fixed costs can be described by other terms in different industries (traffic branches). In road transport, variable costs are often called "recurring costs".
2. "Direct" or "primary" costs are alternative descriptions of variable costs. Similar as with other costs, sometime called "overhead costs" or "additional costs". Each of the mentioned terms has its own special significance, in a special context. The basis of distinction between these two categories of costs is, as we have described in distinguishing variable and fixed costs. In practice the distinction can be made between the cost calculated per unit of time and costs regarded as variable by nature, which can be expressed on temporal basis, because sometimes, as e.g. in passenger road transport, variable costs are divided into two categories of "mile" costs and "time" costs, when the latter cover the salaries of drivers and conductors.
3. Branch characteristics are best noted in a graphical presentation, Figure 1.
   - the broken curve CD represents minimal transportation costs, and corresponds to lorry transport over shortest distances O-A.
   - in medium distance A – B, the lowest costs are in railway traffic, and
   - on the greatest distance (abscissa, right of point B) the lowest costs belong to the ship, i.e. river traffic

   (Stubbs, P.C.Y Tyson, Transport Economics, Allen and Unwin, London, p. 129)
4. The tendency of wide range businesses is to satisfy through production the most part of their proper needs, whereas smaller businesses satisfy their needs through purchase from external sources. E.g. railway builds its own locomotives, police their own stations, and they conduct their own medical research. Road transport receives a far narrower scope of activities.
5. The service of determining costs has been defined by the British Transport Committee. Trial results of the research were published by the Committee in the Third Annual Report (ending 31 December 1950, H.M.O. London, p. 70-I).
6. The analysis is interesting, regarding a certain form of transport in USA, where a detailed research was conducted on railway costs, costs of lorries and the Mississippi Valley barges. The results were published in Comparisons of Rail, Motor and Water Carrier Costs. Department of research. Document of the Senate No. 84, '79. Congress. 1. Meeting. In this report the studied traffic routes have been compared in detail. The findings of the report are impossible to check. Edgar M. Hoover uses the report finding in order to illustrate a typical relation between roads, rail and water carrier costs (Hoover, the Location of Economic Activity, McGraw – Hill Book Company, Inc., New York, Toronto, London, 1998, pp.19-20).
7. In circumstances in which fixed resource used great intensity, the relation between fixed and variable costs can be so small that the fixed cost per unit of product will provide an amount which is a small part of the variable cost per unit of product. This is the case regarding main motorways and road transport. Whereas annual costs of motorway can be big, if considered as an average compared to the great distance travelled by the vehicle, the motorway cost per mile will appear in the vehicle as a very small figure compared to the cost of vehicle operation per vehicle-mile. Whether motorway costs will be included or not in the road transport costs, therefore, does not greatly influence the cost per vehicle-mile.
8. It is probably the empty seats in trains and insufficiently used resources in off-peak periods which are the factors affecting the popular attitude that railway has a high degree of "spare" capacity.
9. The meaning of cost in its economic sense may be illustrated by the statement: "I cannot afford a taxi, it is too expensive." It means, in fact, that I have not got enough money or income to afford a taxi ride. I could always save the necessary amount by spending less on other things. However, I am not prepared to do it, because I still prefer these other things. For me, the price of a taxi fare is something that precedes other things, therefore, in my opinion, the cost is too high. Similar situations occur with the use of rare profitable resources. The cost of using the resource unit is represented in what preceded regarding other things, that might be produced in the most valuable alternative use.
10. Transportation demand is defined as total demands for transportation services which their users want and may purchase, at a certain price and over a certain period of time. Traffic supply is, on the other hand, the amount of goods that the users can offer at certain prices on the traffic market and at a suitable time. The definition reminds of the fact that it primarily depends on the price, since there is a direct proportion between the price and the offered quantities (or traffic services).
11. Some authors (V.Gašparović – Uvod u ekonomiju i organizaciju proizvodnje, Zagreb, 1984), in this situation, even assume a continuation of a certain inertia costs increase, which in our opinion represents neglect of any monitoring of the future trends that tend to avoid such surprises.
12. Jelinović,Z.: "Ekonomika prometa", Zagreb, "Informator", 1972, p.121

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