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EU TRANSPORT POLICY ON THE 1520mm RAIL AREA

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Abstract

This study attempts to understand the impact of the EU transport policy on rail infrastructure primarily for freight transportation. The study also gives insights into railway economical features, including competitiveness and financing issues. The "market can bear" level assessment methodology offered as results that may be used for railway charging for freight services based on efficient, transparent and non-discriminatory principles as stated in the existing EU rail transport policy. The findings were obtained using experts' focus interview method. It can be concluded that for the European 1520mm railway with primarily freight transportation balanced charges can be achieved when the state compensates expenses of the infrastructure manager not covered by charges of other modes of transport as well as disadvantages of legal and administrative requirements in the railway sector.

Keywords: Track access charges, rail transport policy.

1. Introduction

1.1. Background

Over the last two decades the European Commission (EC) has been very active in restructuring the transport market in order to shift transportation to more socially beneficial transport modes including railways. The EC efforts have concentrated on three major areas: opening the rail transport market to competition, improving the interoperability and safety of national rail networks and developing rail

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infrastructure. The first activity has been supported by opening access to rail infrastructure and by harmonizing the technical, licensing and charging rules. Given that the railway in the Member States was built in different historical conditions and for different needs, the unification of railway usage is crucial in the formulation of future transport policy documents.

This paper is mostly dedicated to the European Union (EU) track access charge policy, where infrastructure managers (IMs) must set the track access charges at the costs directly incurred by the train service (DC). From the general microeconomic theory point of view, the situation when the average costs of one-unit transportation are equal to the DC is possible only if the rail infrastructure has the same technological conditions within the whole network and it is equally and fully loaded with uniform trains. Such an ideal situation is not found anywhere, especially on networks where freight transportation exists, because freight railway undertakings (RU) have to satisfy their consumer needs, such as to run at a specific time or within a particular route etc. Moreover, freight transport experiences seasonal and cyclical fluctuations, that are usually not predictable due to dependence on market conjuncture. Losses caused by initial unevenness of the network with some exceptions may be covered in two ways: (1) by the Member State aid and (2) by levying of mark ups. The second method is limited by the EU track access charge policy to the level of "market can bear" and must secure the competitiveness of rail transport. The method involving state aid has different perceptions from taxpayers' point of view depending on the structure of railway services in the state. It means that taxpayers are ready to pay for tangible railway social benefits, such as transfer speed or clean air, but completely are not ready to pay for commercial advantages of RUs.

It is understood that, all railways combine freight and passenger services, but both cost structure and revenues of the railways which deal mainly with freight and those railways which deal mainly with passenger traffic on a public service obligations (PSO) basis are completely different (Pittman, 2007). Therefore, the readiness of a state to pay for rail infrastructure according EU transport policy differs significantly. Figure 1 schematically shows various situations of the forwarder, consignee and IM's relations. In the cases a), b) and c) the state is interested in financing the infrastructure, since transport effects (export growth, provision with resources etc.) influence the country's economy. In the cases d), e) and f) the benefits of the state from financing the infrastructure are not obvious, and provision of special charging is motivated by the international agreements and economic relations between the states of the forwarder and the consignee with the transit country.

The total rail network revenue consists of the revenue from passenger tickets (about a half) and the government subsidies (more than one-third), while the revenue from freight transport is about one-fifth of total in EU average (Gleave, 2016). Consequently, from the point of view of an average EU citizen, they don't mind paying either higher ticket fee or taxes to aid the rail network as they see themselves as its main users. In contrast, in the instance of Latvia, with primarily freight transportation, the major revenue is received from the freight transit services from the CIS countries (where full cost recovery has been available by now), one third comes from PSO funding and the minor part is covered by passenger tickets. So, an average Latvian citizen would abstain from subsidising rail network with their taxes because they don't see themselves as main beneficiaries. Moreover, Proost et al. (2011) stated that there is a perception

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that since the greater the part of the traffic has foreign origin, the smaller the part of the financing should have national public funding source.

This example shows the importance of identifying the social perception of a transport policy. The rail market has also lots of other natural imperfections such as asymmetric information, lobbying processes, RUs abstention from competition etc. (Alvarez San Jaime et al., 2016; Hudenko & Pocs, 2013) that should be considered in devising charging policy instead of the idealisation of rail market conditions.

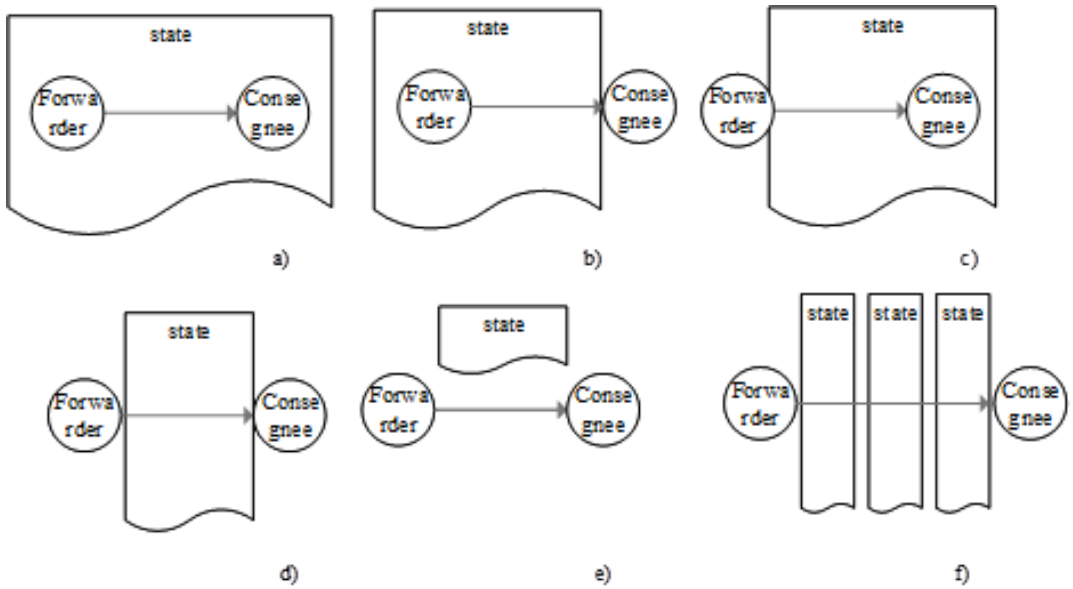

Figure 01. Situations characterizing willingness of the state to finance the rail infrastructure depending on the location of the forwarder, consignee and infrastructure manager (Hudenko, 2016)

1.2. Previous studies

This paper is the second part of the study aimed at finding a fair way to finance rail infrastructure with primarily freight transportation, i.e. to distinguish between social and commercial benefits of rail network maintenance and to link the distinguished benefits with the relevant payer. In the first part of the study (Andins & Hudenko, 2017) the mark-up concepts were disclosed, and the algorithm of market segmentation was created based on the conclusion that the requested deviations from the optimal usage of the EU rail network with primarily freight transportation leads to the distinction of market segments. According to the proposed algorithm the segmentation of a rail market must be done in three dimensions:

- based on the impact of different types of utilization of the rail infrastructure on the cost of rail infrastructure. For example, if a RU requests specific departure or arrival time for combined transport then the train control costs will increase;
- based on the productivity achieved by RUs due to preferences of rail network. For example, the priority of the train will improve the service provided compared to competing modes of transport;
- based on the impact of the allowable mark-up value on the competitiveness of the final consumer market. For example, fluctuations of the world oil price will result on the ability to pay for the transportation of oil.

The first two dimensions must have a clear cost base. However, according to the study, although RUs are ready to reimburse additional costs of deviations that have commercial output, they are not ready

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to disclose the commercial value of deviations requested in the second dimension. The last dimension has a lack of information on decision-making and asks for deeper exploration. Other questions not covered during the previous stage of the study are (1) how to assess the level of the mark-ups in the market segment based on the information available to the charging body and (2) how to exclude a damage of social benefits from mark-ups in order to attract public funding for social advantage so that railways have commercial preferences.

2. Problem Statement

It is easy to assess what the passenger market "can bear" due to open information on ticket price levels, demography statistics and the state subsidy policy. But information about freight transportation tariffs, value added of goods transported within a network, and solvency of final consumer has commercial secret status and can be assessed only in general. At the same time, competitiveness of the freight has commercial nature and is associated with the ability of the transport mode and logistic chains to meet consumer needs (Rishkov & Starih, 2013). It means that costs of providing freight services definitely cannot be equal to DC due to network capacity loses caused by deviations from optimal network usage related to provision of competitive advantages.

In the EU rail networks where passenger transportation share is significant the mark-up for freight charge usually is very close to DC mostly based on expectations that it is maximum of "market can bear" and that freight transportation may be the marginal activity only (Matthews et al., 2009). The existing transport policy is not relevant to the Member states where freight transportation is dominant and the freight market "can bear" more than DC. Criteria that could be used for levying efficient mark-ups in freight transportation are not clear and require additional examination.

3. Research Questions

The following questions were formulated for investigation:

3.1. Who must cover expenses which would not exist on the rail network if it were to work under competitive conditions?

By signing the multiannual contract with the IM, the state defines terms of maintenance, renewal and development of the infrastructure and, therefore, determines the competitiveness and possible charge level of the rail transport. The legislative framework of a state provides level of regulation, custom and other administrative procedures, environment and safety measures that affect the cost base in a way which may be not reasonable in commercial area.

3.2. How can the social and commercial benefits of freight services be distinguished?

The practical application of the new charging rules is very difficult, because of the budget constraints to finance a part of infrastructure costs that market cannot bear. Since there is a derogation in the existing legal framework to set track access charges for the carriage of goods from and to the third countries operating on a 1520mm network, the Baltic states refrain from financing a part of the

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international commercial business. This is one of the reasons why the cargo of Russian origin has a declining trend in the Baltic states and tends to be redirected to the Russian sea ports. Thus, the rail networks are not fully loaded and the social loses appear as increase in transport unit costs in public segments. To prevent these loses, the clear social benefits of financing of international commercial traffic must be identified.

3.3. What kind of criteria could be used for levying efficient mark-ups in freight transportation?

The previous stage of the study has shown that freight RUs are very sceptical about the concept of value-based mark-ups. Other studies (Liozu et al., 2011; Shapiro & Varian, 1999) also considered this concept as too theoretical and ambitious. The cost-based mark-up concept is much more understandable for RUs and, although they accept a need to set mark-ups (Arnott & Kraus, 1998; Mohring & Harwitz, 1963; Proost et al., 2011), the main idea of experts, surveyed in the previous part of the study, was that the charge level should be strictly regulated on the lowest possible price to allow making business in competitive parts of the logistic chain.

3.4. How can these criteria be applied to calculate the level of fair mark-ups?

At least three dimensions of market segmentation were found in a previous stage of the study. The criteria of the dimensions may be controversial, but must be combined based on efficient, transparent and non-discriminatory principles, while guaranteeing optimal competitiveness of rail market segments. As an example, container trains may be mentioned: this kind of service requires priority and at the same time it competes with cheap sea transport and, therefore, asks for minimal charge.

4. Purpose of the Study

This study was conducted to understand the impact of EU transport policy on rail infrastructure with primarily freight transportation, taking into consideration that goals set in the Transport White Paper are not compatible with the existing beliefs that freight on railways is only a marginal activity. This part of the research is aimed at understanding how to link commercial advantages of RUs to pay as small track access charge as possible and social advantages of states to obtain more complete recovery of the costs incurred by the IM based on efficient, transparent and non-discriminatory principles.

The following hypothesis was stated based on the results of the previous stage of the study and was examined at this stage: the level of mark-ups is the maximum value from (1) the valuation of the additional costs caused by deviation from the optimal network usage; (2) value added achieved by RUs due to the preferences on rail network and (3) competitiveness of the final consumer market. All additional costs that are caused by requirements by the state and would not appear in a commercial enterprise must be covered by state funding.

5. Research Methods

The research was conducted in three stages.

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5.1. Preliminary analysis of more than 100 scientific and practical sources

It was concluded that none of the existing charging lessons learned could be directly transposed to the case of EU 1520 mm area. Therefore, the main insights were generalized in propositions in order to conduct expert focus interviews.

5.2. Rail stakeholders' focus interview

The propositions were given to 13 experts in different railway undertaking areas: passenger transportation, freight transportation, infrastructure management, rail market regulation and administration. The questions insignificantly had been adapted for freight and passenger undertaking types. Two experts (RUs' and governmental) from each field had been selected upon assessing their independency, relevancy to the research subject and professional competence on the study subject.

The experts were asked to evaluate these propositions in 6-point system, and provide short (less than 20 words) explanation of their position. Whereas all the examined experts were without knowledge about the legal framework of charging, the questioning was made orally by the field worker and unclear concepts were explained on request.

5.3. Generalization and discussion

The field worker took verbatim report of the interviews. Later the verbatim reports were sent to the experts and they made corrections. The results of in-depth examination were summarized using content analysis. The generalized results were discussed on the annual charging body meeting in order to understand the relevance of the study to the other networks.

6. Findings

6.1. Differences in factual and legal circumstances of different transport mode infrastructure utilization must be covered by the state. Commercial risks must be covered by RUs

The main comment on mark-up level criteria from the commercially motivated experts was that they would like to have a clear understanding of what kind of costs that was previously excluded from full cost base as non-eligible they must pay for now. The experts have clear position that RUs would not like to pay any cost arising from the charge related to the implementation of the state policy requirements, which are different from the rival's infrastructure.

That is an interesting fact that state experts mostly agree with and commercial RUs do not deny the proposition that the state may affect service structure provided by the network by using distinguished charge policy. In experts' point of view, the state may vary the mark-up level in segments where it has a political interest. As an example, cross-national freight traffic was often mentioned.

Nowadays cross-national freight traffic flows are organised within so-called transport corridors (TCs) where the most rapid growth is observed in the market of international container transportation from China to Europe. This is encouraged by the active position of the Chinese government in developing the One-Belt-One-Road initiative (OBOR). OBOR does not provide for a single solution (Nazarko and Kuzmicz, 2017), and the countries that joined the initiative apply maximum efforts to link new global

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economic centres via their territories: offer attractive charges, provide passing capacities and harmonize technical standards, transport laws and carriage documents, simplify the freight rate policy and norms of crossing state borders, as well as generate a reverse freight traffic flow.

The increasing competition among TCs impact the total charge of the TCs:

- on the markets close to perfect competition, they use the principle of short-term marginal costs in which they include the components of variable costs, excluding the capital costs;
- on the monopoly regulated markets, they use the principle of fully distributed costs, adding all indirect costs, including, quite often, those related to other types of activities;
- on the markets with an intermediate degree of concentration, they use 'long-term marginal costs' combining short-term marginal costs and capital costs (or investment costs) in various proportions.

In the point of view of experts, the state must change charges accordingly. The state experts do not accept the same principle for all market segments, but only for those where the state has a political interest. It seems contrary to EU open access rail transport policy where the infrastructure charges must be the same, if factual and legal circumstances are equivalent.

6.2. The social benefits from optimal network usage

The state is interested in the predictable network utilization. Contrary to the commercial experts, state experts mentioned that RUs must utilize the scheduled rail infrastructure in accordance with the timetable and give the IM the right to claim and receive payment for the rail infrastructure capacity, if it is granted but not used. So, the state does not agree to participate in commercial risks related to seasonal and cyclical fluctuations of the freight traffic demand. However, if RUs agree to utilize the railway capacity during the rail infrastructure downtime, and it leads to actual saving of administrative costs due to more optimal capacity usage, then the reduction of mark-up by the cost saving level seems to be accepted. This perception suggests state experts' lack of understanding of the existing transportation market, which is not transportation from point A to point B any more, but is only a part of the global or regional supply chain where RUs are not participants who can determine supply terms.

According to Musalijeva (2015) the major trend in charging of transportation services is development of through rates on the "door to door" principle. This is extremely important for the modern TCs which length is measured in thousands of kilometres, while the number of states involved quite often exceeds ten. As soon as an unregulated monopolized section appears in the TC that is not interested in flexible charging, the development of the TC is not smooth. For example, the joint project ZUBR in which Latvia is involved, never reached its full capacity mainly because of a discussion about the freight rates: to transport a container from Scandinavia to Turkey around Europe was cheaper than forwarding the same container via the Black Sea only. Another example of a monopolized section of a TC is the Lithuanian corridor towards Kaliningrad, where Russian freight owners became hostages to an exclusive situation paying an additional 'transit component'.

Looking at the Northern America example (Hatch, 2014), where an intermodal transportation is the largest revenue segment in the railway sector now, there is a high interest in cooperation within a growing intermodal concept on 1520mm rail area. Marinov et al. (2010) stated that most of railways,

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including Baltic states railways, are lagging behind and, therefore, are losing market segments where there is no scale economy. However trends of the global supply chains (Szyliowicz, 2003), intercontinental transportation (Stone, 1997) and industrial globalization (Rondinelli & Berry, 2000) are factors that push for changes in charging policies. The charging policy of a common logistic chain may differ according to integration stages considered in many studies (Negenborn et al., 2015; Frohlich & Westbrook, 2001; Youn et al., 2008):

- functional integration, that appears as a total cost reduction;
- internal integration, that appears as internalization of common functions, and
- external integration, that appears as a transparency of the system to achieve a high customer value and satisfaction.

Most of the surveyed experts agree that the criteria of cooperation among supply chain members have a significant impact on the mark-up level with the most popular disclaimer from the state experts that the final consumer for the IM is only a RU (not its market conditions). Therefore, the criteria based on the concept of comparing the total cost of cargo recipient (including costs of other members of the supply chain) in competing rail networks was more suitable for the surveyed experts than the assessment of the integration stage of the logistic chain. The disclaimer may be related to the conclusions of the Hudenko and Pocs' (2014) previous study which analysed value-added distribution between only two members of the logistic chain (rail and sea) in the Baltic States. It clearly stated, firstly, the difference between the price levels of rail and sea transport and other failures in logistic chains that are not compensated by market mechanism and, secondly, the lack of cooperation among some of the logistic chain members. The absence of the logistic chain integration may cause negative effect when mark-up shifts will not give comparable benefits to users and will affect the competitiveness of the state transport corridors.

It can be concluded, that since the specific terms and conditions of network usage can be defined for the particular freight service, a separate market segment must be allocated for this type of services, and the mark-up must be assigned on the level of supply chain terms. The difference between levied mark-up and full cost must be covered by state budgets on the grounds of social benefits that provide each additional transportation unit on the cost base for social services. At the same time, a guaranteed use of capacity must be ensured by using reservation fee. The construction material factory may be mentioned as an example. If the factory tenders its product transportation service, where railway must compete with road transport, then if the tender can be reached only in case of a defined track access charge, then the separate market segment to similar services must be allocated with a defined access charge, applying a reservation fee for the full amount of the entire tender.

6.3. Mark-up level dependence on the terms and conditions of rail network usage

According to the EU transport policy, the level of mark ups depends on whether railway is able to compete with other modes of transport, within the charging framework. The comparison of access conditions and charges among competing networks, both railway and other transport modes, was the most

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popular experts' comment when asked about other criteria that should be considered in setting a mark-up. However, it was found that the charge level is only one of the competitive conditions.

Global freight forwarding companies are guided by the Meyer et al. (1971) model or its modifications to assess various logistic proposals, where other competitive factors, such as the time of delivering cargo 'door to door', probability of a damage or delays are considered alongside with the cost of carrying the cargo. For example, the time saving factor was the reason for extensive shift of container cargoes with a short economic cycle (electronics, cars, clothes) from the sea to the railway (Schinas & von Westarp, 2017). Relative security advantages of railways also play a role in diminishing such modern risks as terrorism and piracy.

Factors that impact market's ability to pay track access charges on the grounds of the transportation conditions instead of a charge level are very deviated and unpredictable from de Langen (2016), Rodemann and Templar's (2014) point of view:

- coal – world production, world demand, world prices etc,
- construction materials – existence of big projects; availability of specific rolling stock etc;
- chemical products and fertilizers – demand for agricultural production; state subsidies in key importing states etc;
- wood – world prices for the final wood products; availability of specific rolling stock etc;
- metals – construction programs, world metal prices etc;
- oil and oil products – world price level, consumption level, mode choice etc;
- grains and agriculture products – world prices for the final food products; regional climatic circumstances, fertilizer prices, grants to farmers in the region etc;
- container cargo – flexibility, reduced time to launch on the market etc;
- RoRo transportation – number of RoRo directions; service intensity; a number of providers; a number of stops on the way etc.

Practically, IMs are unable to determine the mentioned values because they even don't have the access to commercial documents of the cargo after the introduction of a vertical separation policy. They are also unable to assess these factors in a transparent manner, since the final freight rates change depending on the multitude of other factors: tax level, world market conditions, changes in the level of prices for substitute goods, rates of currencies, export and import duties, technological innovations and the like.

Moreover, following Woroniuk et al. (2013), in order to increase revenues, an IM may consider replacing less profitable cargo, such as cereals and coal with more profitable goods, such as chemicals and oil by applying higher charges and creating entry barriers for "cheaper goods" that lead to the network load reduction and the increase of socials costs (Proost et al., 2007). It is therefore necessary to evaluate the criteria that affect different types of goods with purpose to detect factors that reduce railway attractiveness and make a decision on charging differentiation timely. Most of the experts agree with these criteria as a mark-up reducing instrument while having strong position that increasing demand for transported cargo could not be the criteria for setting a higher charge.

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6.4. If all externalities are excluded from the cost base, the maximum level of mark-ups must be applied

It should be underlined that most of the factors affecting "market can bear" (MCB) level have external origin – political relations, state's efforts to attract cargo flows and conditions of consumer markets. However, internal factors – integration level within a supply chain and non-price competitive advantages of the network are doubtlessly as important. Given strong external dependency on the charge level, it would be advisable to include charging policy issues in national planning documents. In the absence of the clear state's incentives to cover market imperfections associated with policy relations, international trading policy and fluctuations of final consumer conditions, the IMs will be forced to introduce the highest possible mark-ups in order to prove the necessity of national funding.

As a result of the qualitative study the algorithm of MCB level calculation in the segment s could be presented as on Figure 2 and in the quotation 1. In order to express quantitatively the level of mark-up within a specific market segment (MUs) the difference between full cost of providing the minimum access package and the network-wide direct costs divided by the traffic indicator should be multiplied by the market valuation ratio MCB, determined according to the experts' assessment of the significance and the development of each MCB criteria:

$$MUs = ((PI - KTI) / DR) * MCB\ s, \quad (1)$$

where:
PI – full cost value where all costs related to the implementation of the state policy requirements different that in rival infrastructures are excluded;
KTI – the network-wide DC;
DR – traffic indicator;
MCB s – a ratio characterizing the allowable level of mark-ups in the given market situation in the particular market segment s which is determined as in quotation 2:

$$MCB\ s = \max (C\ s; V\ s; \text{and } S\ s) \quad (2)$$

where:
C s – a valuation criteria characterizing the impact of requested deviations from the network optimal usage on the cost of rail infrastructure within a specific market segment (full costs with requested deviations and full costs without requested deviations ratio);
V s – a valuation criteria that characterizes the productivity achieved by railway undertakings within a specific market segment due to given preferences (tariffs with preferences and tariffs without preferences ratio);
S s – a valuation criteria that characterizes the optimal railway competitiveness within a specific market segment that depending on state planning document is either criteria J s or R s , where
J s – a valuation criteria that characterizes the state intention to attract traffic within a specific market segment (depends on market conditions in TC or tender results);
R s – a valuation criteria that characterizes the impact of the allowable mark-up value on the competitiveness of the final consumer market within a specific market segment (assessed by expert method).

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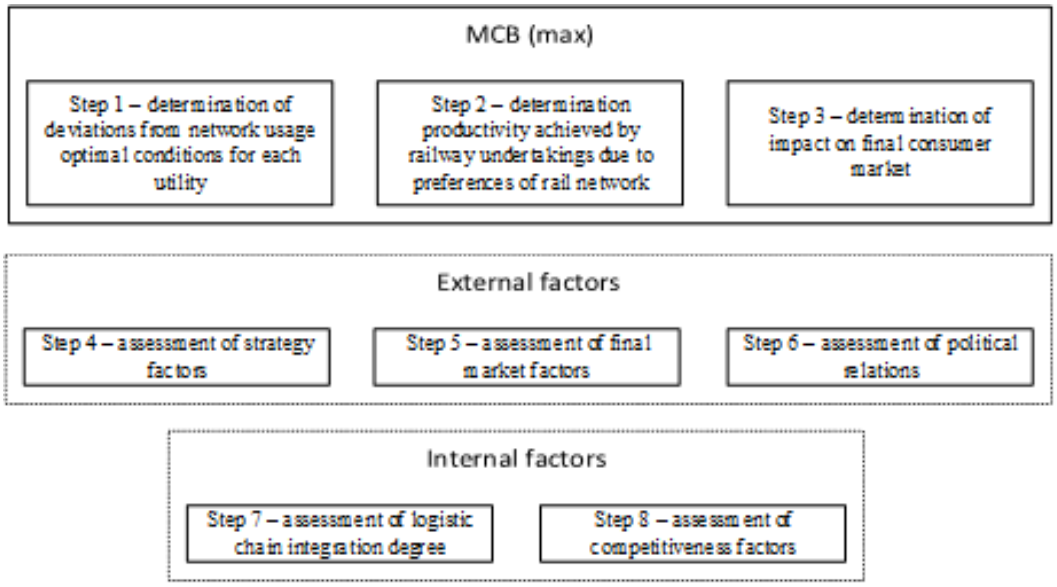

Figure 02. The algorithm of the assessment of "market can bear" level

7. Conclusion and Implications

On the European 1520mm railway with primarily freight transportation the balanced mark-up can be achieved when, on the one hand, freight operators compensate additional IM's expenses that are incurred as a result of requested deviations from the network optimal usage cost base and, on the other hand, the state compensates IM's expenses that are not paid for by other modes of transport. The state planning documents may provide additional mark-up differentiations in order to: (1) increase competitiveness of the state on the global transport service market and (2) to decrease one transportation unit cost in social transportation services by optimization of the network capacity usage.

It is possible to draw a conclusion that the era of charging based only on cost allocation is over due to the increasing competition of freight transport corridors. On the markets with primarily freight transportation the following charging scheme effectiveness criteria should be considered:

- clear compensation for all the externalities and non-commercial expenses included in charge;
- engagement of all participants of the logistic chain, including the state, in the charging decisions;
- flexibility and adaptability of the scheme to the final consumer market conditions and activities of the competing transport corridors;
- extensive database required for decision-making.

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