The Discrepancy between the Service Export Incomes of Rail and Sea Transport among Baltic States Transit Corridors

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ABSTRACT

Making the observation of export incomes in the Balances of Payment (BoP) of the Baltic States it was observed that there was no coherency between trends of rail and sea transport service income level. This study was aimed at the examination of this phenomenon in order to understand what causes service income level differences and if it influences the competitiveness of transit corridors of the Baltic States. A combination of statistical methods for data processing was used: grouping, extension and graphical representation as well as trend analysis.

It was concluded that total seaport-rail charge level in international transportation has an increasing trend, where rail service charge level rises faster than that in maritime service. Incoherence and duplication of processes, inelastic charge regulation as well as uneven capacity usage affect the competitiveness of the observed transport corridors and are not compensated by market mechanism and, therefore, should be taken into account when developing strategies for improving transit corridor competitiveness.

Keywords: competiveness of transit corridors, rail and sea transport service in Baltic States, logistic chain, charge coherency

1. INTRODUCTION

The geographical position of the Baltic States gave historical impulse for development of sea transit business. The share of freight transportation services export in total services export according to BoP in 2012 was 50.4% for Latvia, 60.2% for Lithuania, for 39.2% Estonia. The dynamics of the sea and rail transportation services export in the Baltic States are different; but all have had an increasing trend in the last decade. This could be due to a rapid export growth of neighboring countries in the petroleum, petroleum products, coal, fertilizer and other goods and the increase in the import of consumer products.

The audit company's KPMG International [15] made a statement that the share of the sea and rail transportation services export in the Baltic States in the Baltic Sea basin has dropped in the last decade due to the progress of Russian seaports where a variety of ambitious projects were realized [9]. There are also possible changes in transportation directions to other Russian basins available. Asa a result, Russian seaports' capacity provided transhipment of 90.0% of metal, 75.5% of coal, 53.2% of fertilizer, 50.4% of ores and 89.0% of liquids [13]. Further development of Russian seaports could redirect existing cargo flows to Russian transit corridors if the Baltic States' transit corridor had no competitive advantage. Similar conclusions made World Bank's experts [25] in the study on competitiveness of Latvian seaports, initiated the Ministry of Transport of Latvia in 2013. The encouragement of port competitiveness was stressed in all Baltic countries; however, there wasn't common understanding of what drives transport flows to one or other direction. Therefore, diverse compositions of factors that determine port competitive ability were mentioned in different studies (for instance: [8], [15], [26]).

It is important that exported transportations services in observed countries are mostly not single modal, but are the parts of international logistic chains that include different kinds of services and transport modes both inland and out of board. That is why the coherent and uniform development of all logistic chain parts and their interconnection is relevant. Therefore, the factors of competitiveness in the transit corridors could be divided in two big categories: (1) analyzing each of the logistics chain operator's activities and (2) analyzing the functioning of the logistics chain. While sufficient attention is given to the first category, the other is not currently explored in detail.

Each state in the Baltic region has its own strategy of cooperation with a different extent of integration among the partners of a logistic chain and it is still unclear what kind of factors force them. In Estonia, there is a Logistic cluster. In Lithuania, there is an international East West Transport Corridor (*EWTC)* project. In Latvia, there is an association of transit businesses, which is the less integrated form of cooperation among the Baltic States. The Latvian Ministry of Transport launched the project to create a so-called Latvian single "super expeditor" [19]. The initiative was recognized as "unnecessary" and "monopoly and corruption stimulated", while several players said that the industry really suffered from the lack of coordination between ministries and public institutions as well as insufficient promotion of the transport and logistics services. Therefore, the Ministry's initiative was limited to the "one stop shop" concept of the "International Freight Logistics and Port Information System" (SKLOIS) [17] aimed at single electronic movement of information and documentation flows.

This study was aimed at analyzing of the existing situation and the options of different forms of logistics chain cooperation to provide coherent and competitive price level of transit corridors in the Baltic States.

The execution of this study was affected by the lack of statistical data related to the overall approach to measure the performance of the transport sector with the non-financial indicators, as well as confidentiality of the financial data. The work of the analysis is based on the authors' constructions of the available data for rail and maritime transportation - BoP data for maritime and rail transport services exports of the Baltic States, extending them to the volume of international movement in tones. Therefore, the evaluation of conclusions should be made in strict connection with the context and assumptions of the study.

A combination of statistical methods for data processing was used: grouping, extension and graphical representation as well as trend analysis.

Despite the fact that the strongest competitor in the Baltic region is Russia, reliable and comparable statistical data of the Baltic region of this state is not available, so the authors failed to assess whether the processes that have been investigated in the study are relevant to the Russian transport sector. Due to *Eurostat* changes in the grouping of cargo in 2008, the retrospective of the analysis in Chapter 3 was limited by the period 2008-2013.

2. THE RELATIONSHIP BETWEEN TRENDS OF INTERNATIONAL RAILWAY AND MARITIME REVENUES

The transport statistics is given mostly in non-financial form. It gives a clear picture of the goods carried, their quantity and composition, but such prominent figures as provided value added and productivity could not be inferred due to their combination with the financial information of other types of services. The detailed information on request is not provided as well, given that it is related to few companies only and, therefore, is a commercial secret. In this context, the components of the rail-maritime service total price were analyzed by combining indirect indicators from various sources.

The analysis was based on data of maritime and rail transport services exports, related to the main cargoes handled at the ports in tones for maritime transport and to international movement loaded in tones for rail transport (see Table 1). The findings made in this manner may not be comparable (without the assumption of different expression) to measure the price level in the countries concerned, but they are reliable enough to see the resulting ratio of the growth dynamics.

It could be observed on Figures 1-3 that only Lithuania demonstrates coherency between dynamics of revenue for both transport modes, but in Latvia and Estonia (after clearly tipping point around the time of 2003 to 2004) the revenue per ton varies from one transport mode to another. This variation has different manner: the higher revenue per one tone in rail transportation was obtained, the lower it was in maritime transportation in Latvia and there is the opposite trend in Estonia.

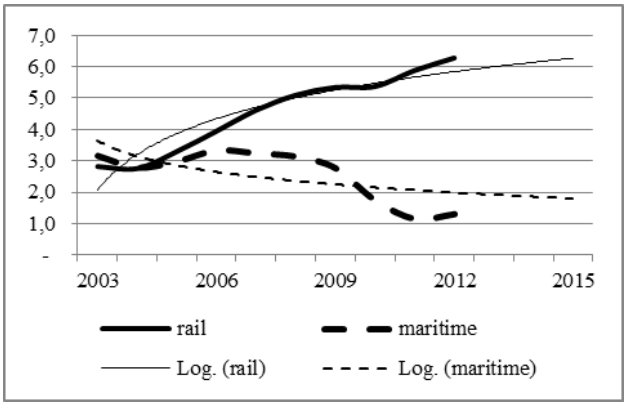

Figure 1. The Relationship between Trends of International Railway and Maritime Revenues in Latvia
Note: Log. – Logarithmic trenline
Source: Authors' composition based on Table 1 data

Statistical analysis showed that determinations between maritime transport and rail transport price level differ in all observed countries (strong in Lithuania and very low in Estonia). There are different kinds of relationship (direct in Lithuania, opposite in Latvia and none in Estonia) between international railway and maritime revenues in all the observed countries.

So the trends in income redistribution between opposing logistic chains are not compensated by market mechanism and one or more additional factors should be taken into account when developing strategies for improving transit corridor competitiveness.

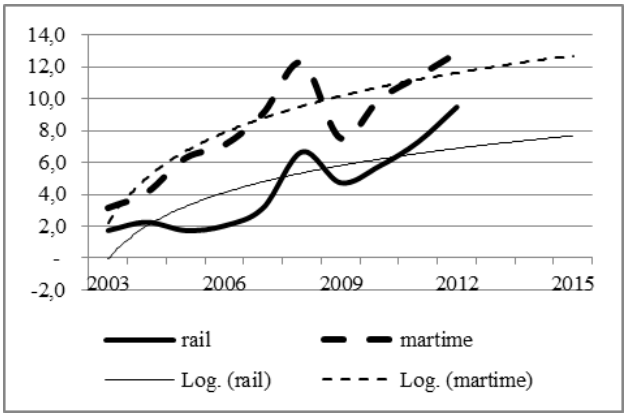

Figure 2. The Relationship between Trends of International Railway and Maritime Revenues in Lithuania
Note: Log. – Logarithmic trenline
Source: Authors' composition based on Table 1 data

For understanding possible reasons, an analysis of highly quotable sources of literature was used. It was found, that researchers emphasize the management

reasons of income redistribution: diversity in corporate culture, policies and procedures of the strategy of supply chain participants [12], a mismatch of the aims and objectives [4], lack of cooperation [14], distrust and suspicion between the organizations, as well as apprehension of information and uncertainty with performance measurement systems [5], [18], [3]. There is also the economical reason: the market mechanism redistributes surplus among logistic chain participants in uniform way and under similar conditions, where participants with the higher degree of monopolization have a higher premium [16].

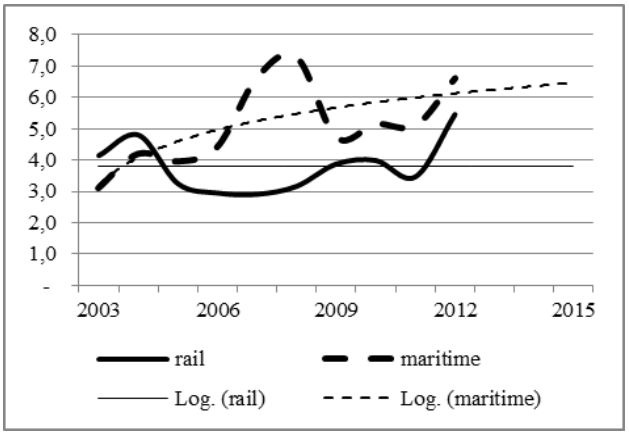

Figure 3. The Relationship between Trends of International Railway and Maritime Revenues in Estonia
Note: Log. – Logarithmic trenline
Source: Authors' composition based on Table 1 data

The above-mentioned sources discuss mainly similar logistic chain that is not relevant to the Baltic States' case where multiproduct transportation could be observed. A brief overview of the freight transportation trends ([1], [10], [11], [13], [21], [22], [24]) in the Baltic Sea region shown that:

- Total cargo flow in Baltic sea region has grown significantly in the observed period;
- The Baltic States' sea ports have strong competition with developing Russian sea ports in the same region. Coal and oil cargo traffic have trend to turn to other transport modes and other sea basins;

Specialization trends for Baltic States ports could be observed: Latvia in bulk cargoes, Lithuania in dry and general cargoes and Estonia in liquid cargoes. According to *Eurostat* the share of coal in Latvian total traffic was zero in 2000, but it reached 37% in 2012.

Each of the observed logistic chains contains a rail state monopoly, which is influenced more by national policy and less by market mechanism. Microeconomic theory states that a monopoly position allows setting prices that are higher than the perfectly competitive market prices. It could be logical, that if rail charge is mostly slowly increasing then competing sea ports are compelled to lower their charges. This may cause the situation where non-monopolized members of the logistic chain become dependent on the monopolized "neighbor's" price level and are forced to set the price, which is the gap between market total price and the monopolized participant's price. In Latvia the relative revenue reduction in the maritime transport may be associated with the increasing share of "cheap" goods.

These processes could be influenced by charging processes in imperfect competition circumstances. Rail infrastructure managers are natural monopolists for domestic market and olygopolists for transit corridor, port infrastructure managers – olygopolists, but operators (rail undertakers, stevedoring, etc.) are mostly monopsonists (usually deal with a specific product groups and work with specific products shippers). From theoretical point of view this fact indicates that the Lerner Index [2] (relative difference between price and marginal cost) should be naturally different from zero for the mentioned market stakeholders and its deviation depends on the level of market imperfection and the ability of state regulation to deal with it. The same Lerner index for maritime transport is much closer to the solitary [20] and, therefore, the maritime transport has double pressure on charges.

Admittedly, certain charge regulation cannot deal with this problem. Firstly due to possibility to control only a part of market (related to infrastructure) and, therefore if once infrastructure charges were administratively reduced, the surplus would be taken over by the next logistic chain member with greater monopolization position (probably operators and stevedores) and the total price level of transit corridor would not lower. Secondly, due to asymmetric information as publically available data is not enough to make accurate calculation for charge regulation. Lastly due to lobbying processes taking place in the regulation. Thus, the assessment of equitable redistribution of margins can be done by evaluating specific projects only when the data is fully available. However, this may cause a risk of cartelization.

It can be concluded that the price level of one member of the logistics chain changes the price level of other members of the logistics chain in one direction only: price increases in the more monopolized logistic chain part reduce prices of the more competitive part.

Assessment of trends indicating a potential scenario shows that the difference between the price levels of rail and sea transport price level will continue to rise in favor of rail transport. The existing market mechanism and its regulation do not ensure the correction of the situation. Taking into account the tendency to transport units with the lowest proportion of value-added, it would be necessary to improve the logistics chain collaboration between participants. Next chapter is dedicated to an examination of the possible cooperation mechanisms among the members of logistics chain and of the impact to the coherent and competitive price level of transit corridors.

Table 1.

Export of Services and International Cargo Movement for Rail and Maritime Transport in the Baltic States in 2003−2012

	2003	2004	2005	2006	…	2010	2011	2012
Export of services (milj EUR)								
Rail								
Estonia	160900	205600	133800	123900	…	102600	88500	123300
Latvia	129871	134082	172201	182829	…	257320	342302	371512
Lithuania	65770	75930	60460	74720	…	195800	271480	326980
Maritime								
Estonia	146200	188400	184300	221200	…	237200	247600	287900
Latvia	172640	152694	178072	189595	…	101751	76692	94354
Lithuania	94810	106080	164120	193280	…	377470	486870	529070
Cargo loaded (ths t)								
Rail international traffic								
Estonia	38798	42812	41195	41961	…	25712	25524	22578
Latvia	42343	44062	46523	41486	…	44179	53370	54614
Lithuania	14229	16592	15729	16681	…	19600	24090	22323
Rail transit traffic								
Estonia	0	0	0	0	…	0	0	0
Latvia	3683	4568	5704	4840	…	3722	4822	4558
Lithuania	23783	17156	19194	20197	…	14343	13194	12163
Main seaports								
Estonia	47048	44808	46546	49998	…	46026	48479	43503
Latvia	54652	54829	59698	56861	…	58691	67016	72723
Lithuania	30242	25842	26146	27235	…	37869	42661	41033
Revenue of export services per tone								
Rail								
Estonia	4,15	4,80	3,25	2,95	…	3,99	3,47	5,46
Latvia	2,82	2,76	3,30	3,95	…	5,37	5,88	6,28
Lithuania	1,73	2,25	1,73	2,03	…	5,77	7,28	9,48
Maritime								
Estonia	3,11	4,20	3,96	4,42	…	5,15	5,11	6,62
Latvia	3,16	2,78	2,98	3,33	…	1,73	1,14	1,30
Lithuania	3,14	4,10	6,28	7,10	…	9,97	11,41	12,89

Note: 2007−2009 are omitted for representation not for analysis
Source: Authors ‘construction based on BoP and *Eurostat*

3. AN EXAMINATION OF THE POSSIBLE COOPERATION MECHANISMS AMONG THE MEMBERS OF LOGISTICS CHAIN.

Based on micro-economic theory, it may be predicted that those members of logistic chain that work in a competitive environment might lose their mark-ups in the context of the increasing competition between transit corridors and trend to serve cargo with low added value. Those mark-ups can go down to a negative value, and price cuts will continue until the price reaches the value of the marginal cost. The following price cutting would force attempts to “add” weak parts of the logistic chain to more monopolized companies or, in situation where this scenario is not possible for various reasons, would form an integrated structure to redistribute surplus.

The European Commission in its efforts to liberalize the railway sector has determined that charging for all current monopolistic objects should be performed without discrimination to potential users and set at marginal cost level. Exploring such regulation in direct way, the surplus of the logistics chain with the observed mechanism will move to cross-border logistics chain members. As a result, the Baltic States probably will lose the added value, which according to *Doing business* indicator [26] is the lowest in region at the moment.

So market regulation could probably work only in a case when all logistic chain members are the subject of single adjustment and aimed not only at reduction of mark up, but have ability to deal with common price distortion processes [7]. The market regulatory mechanisms must be able to provide similar performance to all the logistics chain, regardless of

their legal position. It has to act equally on state and local government enterprises pricing processes and commercial economic activity. Thus, the analysis of possible solutions ([23], [6]) of the logistic chain control treatment was done by evaluating (using scale 0-1, where 1 is the best possible result) of two main conditions: the ability to regulate in effective way versus ability to provide regulation. The results of the analysis could be observed in Table 2.

Table 2

The results of analysis and evaluation of regulation mechanism of the logistic chain

Regulation mechanism	Ability to regulate in effective way		Ability to provide regulation	
Association	− Certain freedom and independence of the members; − Clear relationships and obligations; − May agree on a common process: making a marketing research; strategy; lobbying.	0,6	− Low cost of networking − Cannot provide consolidation if ones can reap more benefits than other; − Cannot attract a significant amount of capital to carry out joint projects.	0,3
Cluster	− Can include outside sector companies, state bodies, research institutions, etc. − Has an extensive support by European funds. − Can take a variety of legal forms for the organization.	0,8	− Members must ensure fulfillment of commitments; − Can combine the companies that are already involved in other types of associations (have other obligations).	0,8
Consortium	− Can provide a specific service; − Requires a concerted effort of several members; − May participate in international tenders.	0,7	− Maintain the independence of economic activity; − Current legal regulation fail to provide full examination of this model.	0,4
Concern	− Is in full control of the capital holder; − Is contrary to the European Commission's policy;	0,5	− Connects in the strongest possible way; − Provides centralization and unification of functions.	0,9
Pool	− Can be recognized as a cartel agreement and thus the activity may be prohibited.	0,4	− Centralizes financial flows only.	0,4
Strategic alliance	− Combining of functions occurs only by mutual agreement; − Ability to describe limitations related to the different legal position of members; − Can join also competitors, which can combine their efforts in any area.	0,8	− Reduces the information risks in investment projects and promotes the effective use of resources; − Affects competition; − The members can keep their existing structures and other features of independence.	0,6

Source: Authors' composition

Summing the evaluation of different regulatory mechanisms, it can be concluded that the best form of the adjustment of market imperfections in logistics chain can be recognized clusters based on public (state) initiative. This instrument is able to provide socially significant projects aimed at increasing of the common welfare; to increase the investment attractiveness of transit sector; to involve in projects related interdisciplinary activities.

The results of this analysis explain differences in coherency of the revenue level in the Baltic States; the highest coherency is reached in Lithuania where second best regulation mechanism is implemented. In Estonia the best mechanism does not work properly due to cluster formation around the seaport of Tallinn, therefore the surplus is shifted to maritime transport. In Latvia the weakest regulation mechanism is explored at the moment, therefore incoherence and duplication of processes, inelastic charge regulation for monopolized logistic chain participants as well as uneven capacity usage affect the competitiveness of observed transport corridors and are not compensated by market mechanism tehrefore surplus is shifted to the monopolized participant of the logistic chain.

4. CONCLUSIONS AND PROPOSALS FOR ACTIVITIES

As a result of the study it could be concluded that total seaport-rail charge level in international transportation has an increasing trend, where rail service charge level rises faster than that in maritime service. The detected failures of the logistic chain market are not compensated by market mechanism and affect the competitiveness of observed transport corridors. The assessment of trends indicating a potential scenario showed that the difference between the price levels of rail and sea transport price level will continue to rise in favor of rail transport.

Taking into account the tendency to transport units with the lowest proportion of value-added, it would be necessary to improve collaboration between participants

of the logistics chain. The analysis of possible solutions showed that the best form of the adjustment of market imperfections in transit services logistics chain can be recognized clusters based on state initiative, which provide a public-private partnership. It would be useful to encourage competing transport companies' participation in cluster in order not to distort competition.

5. ACKNOWLEDGEMENTS

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