

European Added Value of the TEN-T Corridors. Basic Research Needs and Challenges

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ABSTRACT: The main objective of the paper is to stimulate the research processes focusing on the measure of European added value (EAV). By relying on present research results, the author indicates that there is a need to examine the mechanism of creating and distributing EAV generated within EU core network corridors. It has been pointed out that the core research activity should be oriented towards analyzing the market processes determining the distribution of the value across the logistics value chains. The distribution process should be viewed within the three basic dimensions: 1/ spatial, 2/ network, 3/ functional. It has been stressed that there are no possibilities to adapt such macro- and micro-economic models like: CBA, ENPV, RAEM, Trans-Tools or NEAC to measure EAV. As a result, within the further research only the dedicated economic and statistical analysis as well methods for measuring the quality and value of logistics processes may be efficiently used.

1 INTRODUCTION

The subject of the paper which refers to selected issues which need to be examined in ongoing and upcoming research projects carrying out in the EU, e.g. Horizon 2020, focuses on initial assessing the development of the core network corridors of the EU trans-European transport networks - TEN-T (Brander et al. 2012). They are perceived in the context of their multi-level impact on the economic environment, comprising mainly the transport and commodity systems and markets of the EU Member States – in the internal and external relations (Fermi et al. 2011, Celbis et al. 2013). The said corridors, characterized – in accordance with the assumptions regarding their development – by the promotion of multimodality and interoperability on the European level and elimination of obstacles in goods and passenger cross-border transport, should establish:

- 1 qualitatively new dimension of economic space – mainly the transport and logistics space of the EU and its Member States, leading to the integration of still significantly fragmented transport markets, and consequently to the establishment of Single European Transport Area (SETA) based on the principles of sustainable mobility,
- 2 fundamentals for building spatial and territorial coherence of the EU, which in turn should facilitate the implementation of the transport policy and coherence policy objectives, providing at the same time framework for streamlining the planning and spatial development within the EU with the use of transport infrastructure, as a component of network industries,
- 3 the European value added, as a final result of creating the new system of transport infrastructure network which is going to affect strongly the increase in the competitiveness of the EU Member States on the global markets – both transport and commodity ones, by strengthening the rate of

growth and the level of innovation development of the said organization within network industries until 2030.

The essence of the presented problem which needs to be undertaken in form of comprehensive research, should involve mainly (Grzelakowski 2014):

- identification of the research problem, i.e. defining accurately the category of European added value which, so far, has not been clearly defined, and characterizing its economic essence,
- defining the economic, technical and organizational and legal conditions, and factors affecting the said category and forming it in short-, medium-, and long-term perspective,
- proposing a form which would enable the quantification of European added value – presenting methods for its measurement,
- analysing processes of establishing added value through the European TEN-T transport corridors which will become integral components of the transport and logistics infrastructure network existing in the EU Member States,
- defining forms and manners for transfer and distribution of European added value: within single corridor in relations between: network owners and managers – its users – final clients (purchasers of transport services), b/ and between TEN-T core corridors, e.g. Baltic – Adriatic corridor and North Sea-Baltic Corridor (on the example of Poland), c/ and also between core network corridor and other, included in the lower category of transport infrastructure network components, e.g. components of comprehensive, regional and local network; the problems will be presented from multi-level perspective, taking into account not only functional and network aspects, but also strongly emphasized spatial ones,
- assessing the economic results of the construction and development of the EU core network corridors, perceived in the aspect of creating and distributing added value which the corridors should generate on the European level; the said assessment should be performed not only to determine the final beneficiary of the value, but also to indicate possibilities to take it over, to a defined degree, by Member States through effective market mechanism and methods and instruments from the transport and tax policy (Cowie 2010, Mallard & Glaister 2008).

The processes of creating and distributing the European added value and also its transfer – in particular between certain intersecting TEN-T core corridors, should be analysed within the value chain, i.e. added value generated by particular elements of the logistics chains and supply networks using the selected elements of corridor infrastructure (Cartier et al. 2011, Daughtey 2008, Grzelakowski 2014).

The majority of attention is focused on the system of core network transport nodes, in particular urban and port nodes which, as a result of numerous functions and implemented logistics tasks, generate the highest added value (Construction.. 2009, Transport... 2008). They also constitute critical points, the so-called last mile nodes, by determining the effectiveness and efficiency – mainly from the logistics perspective regarding the corridor operation,

of the said highest level of the EU network category (Grzelakowski 2014, Cole 2009).

Taking into account all above presented general characteristics of the selected problems, the scientific objective of the research that needs to be performed, is to examine the mechanism of creating and distributing the European added value generated within TEN-T corridors and to analyse the market processes which determine each of these stages.

2 RESEARCH ORIENTED TOWARDS CREATING AND DISTRIBUTING OF EAV

Development of the core network corridors of the EU trans-European transport networks. should establish:

- 1 qualitatively new dimension of economic space – mainly the transport and logistics space of the EU and its Member States, leading to the integration of still significantly fragmented transport markets, and consequently to the establishment of Single European Transport Area (SETA) based on the principles of sustainable mobility (Mallard, Glaister 2008),
- 2 fundamentals for building spatial and territorial coherence of the EU, which in turn should facilitate the implementation of the transport policy and coherence policy objectives, providing at the same time the increase in innovation and competitiveness of the EU on a global scale, and stable grounds for its sustainable economic development,
- 3 framework for streamlining the planning and spatial development within the EU with the use of transport infrastructure, as a component of its network industries (The management... 2007).

The lack of clear definition of the concept of EAV and methods for its measuring, i.e. calculation mechanisms and criteria for assessing the value, can significantly hamper effective development of EU core network corridors. What is more, it may affect efficient implementation of investment processes co-funded by the EU (e.g. CEF instrument – Connecting Europe Facility). At present, the EU program documentation indicates only elements defining the criteria for assessing the European added value in investment processes related to transport infrastructure, such as:

- significant improvement of transport connections,
- increase in the efficiency, sustainability, competitiveness and cohesion of the European transport.

At the same time, one can find reference to issues as follows:

- 1 increase in the attractiveness of transport for other sources of funding (private),
- 2 speeding up the works regarding the investment projects within transport infrastructure,
- 3 reduction in the banking system interest rates thanks to the reduction in the level of risk,
- 4 improvement in quality standards and increase in the stability of the social and economic system on a national level.

In such situation, if the principles and methods for assessing the EAV generated under the

implementation of infrastructural investments within the transport corridors are not clearly defined, there is a significant risk concerning the freedom of interpretation, which will significantly limit the possibilities of taking objective decisions regarding the co-funding of competitive projects. This, in turn, may lead to distorting the process of their evaluation by the use of CBA or ENPV methodology and creating a series of negative results arising from incorrect allocation of public resources, and generating distortions in the system of infrastructure service markets between the EU Member States. Therefore, the research conducted within the European projects, which will result in defining clear criteria for measuring and evaluating the European added value as well as for assessing its impact on the transport and logistics systems of each of the EU Member States, should contribute to the optimization in the investment decisions on the European level. Taking into account the theoretical nature of such research, it will be possible to use the worked out methodology also on other levels of planning, i.e. the national, regional or urban related level (Brander et al. 2012, Wegener 2008, Ivanova & Kanacs 2010). Such studies will make it possible to develop the principle defining the possibility of optimal (maximizing the added value in the sustainable system of criteria) use of limited financial resources remaining at the disposal of the managers of infrastructure, for the purpose of its development and modernization.

Comprehensive deeper research in this field could inspire to better understanding the possibilities for assessing the impact of complex infrastructural international investments on the economic development of the country, its regions and metropolitan centers by improving their competitiveness, supporting entrepreneurship and innovation, and improving the quality of life thanks to the implementation of new, higher mobility standards. The said issue of important theoretical but also practical aspects should base on the results of analyses comprising various identified forms of the European corridors impact, of qualitatively new operational parameters of transport infrastructure networks – both technical and operational, as well as logistics and functional, on the markets of transport and logistics services and also prior to them, commodity markets (Bruinsma, Rietveld 1999).

Moreover, a very important and innovative result of the research and later on made projects' implementation should involve learning the character of relations between the network service transport markets, i.e. markets of products offered by the components of technical infrastructure and markets of transport services. In the said context, there is also a possibility to examine the rate of change in the said relations, including factors affecting the change and forms of their impact on how both of these markets operate. So far, the specialist literature dedicated to the development of transport and other types (sub-systems) of network industries has been dominated by typically subject-based approach – technical and factual one, related to the very perception and examination of processes concerning the development of infrastructure networks, i.e. quite narrow approach.

The networks of transport infrastructure and its particular components are usually treated as tangible resources of the transport system or more widely, the logistics system, namely, in relation to the typically material aspect, without considering or without due (substantially speaking) consideration of market effects arising from its development. The said effects can be seen not only on the transport and logistics markets but also on commodity and labour markets - increase in mobility of labour resources.

The importance of the research in this area is expressed in the promotion and support (on the theoretical plane) for the strategy of sustainable development of the European core network transport corridors, i.e. transport infrastructure of high quality standards, the so-called intelligent networks which become part of modern challenges for the civilization. The said networks, efficiently built and effectively managed, are able to generate high added value reflected in the increase in social mobility and consequently, improvement in the quality of life and level of social welfare. The fundamental part of research, which has already been indicated, comprises issues related to creating the European value through establishing cohesion areas between the development of transport infrastructure of priority importance for the development of other components of network industries. Only within the said principle, the transport network services offered on the basis of the European corridor infrastructure components, included in the services of basic economic importance for the economy and society (services of general economic interest), can generate the highest added value reflected eventually in the European value.

3 OUTLINE OF THE INITIAL RESEARCH PLAN

The concept of the promoted research on EAV in its fundamental form determines basic stages in research process leading to the implementation of the defined its main objective and the verification of formulated hypotheses. As a result, the research plan needs to include the following basic stages of the research process with the related research tasks to be successively implemented:

- 1 Analysis of the process related to creating values in the social and economic system (welfare, GDP), including the identification and analysis of factors affecting its growth and reasons for its distribution on the sector-based and spatial basis, taking into account, in particular, the specificity of implementing the said process on the EU level (Kiel et al. 2013),
- 2 Defining the role and importance of the transport and logistics sector as an area of economic activity generating added value and analysis of factors affecting its growth, in particular those boosting the creation of values in the social and economic system,
- 3 Building the network model for generating added value in transport, taking into account relations between the markets of transport infrastructure (network services) and markets of transport services along with their logistical dimensions,
- 4 Building the value chain model for generating added value in transport formulated in the

logistics supply chain system as a result of the increase in the quality features of the logistics infrastructure network, and consequently in the quality of offered transport services by the transport infrastructure,

- 5 Defining the mechanism of the distribution of added value (including the European value) generated by transport corridors including the specification of instruments for creating the transfer of the said value on the subject-based and spatial basis (methods for optimization of value distribution based on the multi-criterion system),
- 6 Analysis of complementarity and substitutability of the existing and scheduled infrastructure network systems and their products including the assessment of the network results of transport infrastructure development on the European and national level,
- 7 Analysis of the investment needs related to establishing the TEN-T core transport network (under the results of particular corridors evaluation) and the assessment of the results of the network development in the aspect of transport policy objectives and the policy of coherence and competitiveness.
- 8 Presentation of the results of research teams and conclusions as well as recommendations important both for the economic theory and practice.

The first stage of the implementation of research process should involve critical analysis of the previous scientific achievements related to creating and assessing (measures and their types) the added value in the social and economic system. In such case, it will be extremely important to identify the relations between the concept of added value and the concepts of economic growth and development and social welfare (Brander et al. 2012, Kiel et al. 2013). Making use of the selected methods of analysis, e.g. from modelling the processes of value creation, the authors of the upcoming research projects need to prepare the added value classification system (AVCS) taking into account the spatial scale of analysis where unique place will be reserved for the European Union level.

The second stage of research should focus on the analysis of operations of the transport and logistics sector perceived in relation to the creation of added value and identification and analysis of basic factors of its growth in the TFL (Transport-Forwarding-Logistics) sector, with special attention to those factors which stimulate the most the processes of creating the value in the social and economic system (assessment of the strength of impact regarding particular factors).

The two subsequent stages of research process should aim at creating two complementary models for generating added value in transport which should reflect the mechanism for its generation. Their logical structure are to be based on the same methodological grounds defined in the main objective of the paper, i.e. should take into account the necessary, from the perspective of subsequent stage of research, multi-dimensional character of the value distribution (spatial, network and functional).

The first of the models need to include mainly the type and character of relations existing between the network service and transport service markets by

presenting the process of generating the value from typically transport-based perspective. However, the second model referring to the logistics aspect of the said processes should base on the structure of value generation in the supply chain system, i.e. in the form typical of the (value) supply chain. The main source of data for supplying the analytical model ought to include the results of studies conducted for particular core network corridors between 2013 and 2016 (Studies on the TEN-T Core Corridor Network Corridors) in which the current state of particular corridors was analyzed, indicating indispensable investments eliminating bottlenecks and gaps in TEN-T network Brander et al. 2012, Ivanova & Kancs 2012, Kiel et al. 2013).

The structure of models for creating added value generated by core network transport corridors provides methodological grounds so that in the subsequent stage of research it is possible to determine the mechanism of value distribution, and define a set of instruments with the use of which the transport policy entities on the national and European level, through the system of transport markets, could form the processes of value transfer on the subject-based and spatial basis. Therefore, they can provide division between benefits and costs. The optimization will follow through transport and logistics market mechanism and the mechanism of public regulation system.

Under the results obtained from the completion of previous stages of research, only in two subsequent stages of the research process, complex analysis of the following issues can be conducted:

- complementarity and substitutability of the existing and developed transport infrastructure network systems, including the assessment of network results created on the European and national level as well as ,
- investment needs related to creating the core transport network of the European TEN-T system with the assessment of development effects in this category of infrastructure network.

The final stage of research process should involve presenting the obtained results of research and their interpretation with conclusions and recommendations prepared thereunder. They are crucial for the theory (field of economic science related to analyzing the mechanism of transport market operations) and for economic practice (growth in the effectiveness regarding the development of transport and logistics sectors). The measurable effect of the final stage and also the entire research process should involve practical indications concerning an application of already known methodology of external costs internalization based on social marginal cost pricing model (SMCP).

The particular, above-mentioned stages of necessary research and the related scope of the research tasks of various complexity already presented, can give the chance, in accordance with the defined logic of research process, to implement entirely not only the main scientific objective of the project, but also all specified partial objectives, the so-called detailed objectives which condition the implementation of the main objective and the verification of the defined working hypotheses (The

management... 2007). The group of so defined detailed objectives of the necessary research shall include the need to:

- 1 define and clearly specify the EAV as an economic category, and determine its relations towards other categories of similar character existing within economic sciences,
- 2 develop method for measuring the EAV, and with the use of value chain recognize the mechanism of value generation and its transfer in the system of particular components of the TEN-T core network transport corridors,
- 3 define forms and manners of taking EAV over by the participants of the logistics supply chains located within the core network system,
- 4 assess mechanisms of the EU transport market operations in both network and transport services and the selected instruments of transport policy in the context of evaluating micro- and macroeconomic effects which they are able to generate after establishing the European core network corridors.

4 CONCLUSIONS

The results of preliminary studies conducted previously by the author of the presented paper indicate that:

- 1 the processes of economic integration are conducted in the EU on such a scale they create a specific value for the whole Community (the European value) which, in turn, translates, to various degrees, into all Member States and their citizens,
- 2 The European added value (EAV) is difficult to measure and has not been precisely specified or even defined in the theory of economy. However, both theory and practice use the same category by intuition,
- 3 In the times of crisis experienced these days by the European Union and as a result of the need to re-define the criteria for resource allocation, there is an urgent need to solve the problem since it constitutes an important decision-making element. It refers in particular to the allocation of resources in capital-consuming undertakings such as infrastructural investments in the core network transport systems. It gives rise to begin studies of such nature, i.e. basic – theoretical (defining the category and its relations with other economic categories, learning the mechanism of creating and distributing the category), and consequently, practical – useful for the purpose of economic policy as well as technical infrastructure development policy,
- 4 The European core network transport corridors, thanks to their spatial dimension, mode of construction and operational parameters, character and functions (multimodal) are able to generate high added value which can be perceived in various dimensions, including the European value categories,
- 5 The highest value in the European transport corridor system is generated in their nodes, i.e. the key elements of the transport chain created by the corridor, such as: municipal nodes, seaports,

logistics and intermodal terminals, cross-border nodes, etc. Particularly important are those which constitute the junction point of two or more corridors of such type; in many cases they are also critical links which determine the corridors operational efficiency,

- 6 The construction of the new, trans-European network system boosts the flow of value on the European level which will be transferred through market mechanisms to other links in the supply chain using the said network system, which provides new challenges for the logistics operators and transport markets regulators related to creating optimal distribution of the value with the use of effective price mechanism ,
- 7 The European transport corridors provide opportunity for significant reduction of external costs and rationalization of transport tasks division (co-modality of transport) based on the criteria of sustainable transport development, which provides grounds for the construction of a new model for cost pricing in transport based on social marginal costs pricing (SMC) and consequently streamlining the mechanism of their operation, and as a result, the mechanism of transferring the value generated by TEN-T corridors.

By referring to the above, one can claim that the basic lines of research and defined hypotheses are reflected in the previously conducted preliminary research regarding widely understood development of transport infrastructure of the EU Member States and value created by the transport system. The previous achievements, however, make it impossible to formulate comprehensive conclusions and present fully mature solutions and provide recommendations, and as a result, fail to verify the studied hypotheses. Therefore, it is advisable to continue the research, in particular within the comprehensive and consistently conducted research carried out on the European level.

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