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TRANSPORT SYSTEMS AND THEIR IMPACT ON QUALITY AND EFFICIENCY OF LOGISTICS MACROSYSTEMS

ABSTRACT

Background: The subject of research involves the analysis of the mutual relations existing between the countries' transport systems and logistics areas of the selected EU countries. Such an analysis, giving the possibility to compare countries' transport system, creates at the same time the opportunity to identify their competitive advantages in the transport sector and in the sphere of logistics. The aim of research is to identify the selected transport systems' components perceived as key factors determining their effectiveness as well as assess their impact on logistics macro systems of the selected EU countries.

Methods: Traditional qualitative as well as quantitative research methods were used. Among the latter ones, there are methods of statistical and comparative analysis. Based on the reports of the World Bank and the World Economic Forum, the author has also applied such useful research tools as logistics performance indices (LPI) and enabling trade indices (ETI).

Results: The conducted research has allowed to identify the weaknesses and strengths of the examined transport systems assessed in terms of their impact on the logistics macro systems. The components of transport systems of the selected countries were indicated, providing the leverage of building their logistic position in the global scale, as well as those limiting the effectiveness of the logistics macro-systems, e.g. low quality transport infrastructure. The Poland's position on the logistic map in Europe and in the world was also determined.

Conclusions: The obtained research results allow not only to assess and compare the current state of logistics macro-systems of the countries surveyed, but also to identify activities, mainly of transport nature, that should be taken to improve their functioning. This applies in particular to the chosen EU macro-logistics system in its relations with their transport sector.

Keywords: logistics macro-system, logistics performance, quality of logistics area, transport macro-system.

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INTRODUCTION

The globalization processes of various development rate, observed at the time of industrial revolution 4.0, stimulated by economic deregulation and liberalisation of all types of markets, in particular capital and freight markets, exert also significant impact on the transport markets by creating new perspective of both global and regional transport area. In the framework of common logistics standards of handling the flow of goods and the development of global smart supply chains and networks, this area has strongly been anchored in the global system of logistics area. As a result, we can observe gradual and real integration of TSL global sector, on the regional and global scale, based on the formula of integrating its markets with commodity markets. Consequently, a number of facilitation instruments and improvements are developed in the world trade transport services provided more and more extensively within the global value chain based on the standards of logistics efficiency of global commodity flows. It is estimated that today, at the end of the second decade of the 21st century, global value added chains cover already over 60 % of the world trade commodity flows (at the beginning of the first decade it was only 42 %) [WTO 2018].

However, despite visible progress, the integration of freight and transport markets, and consequently the development of globally coherent transport and logistics area failed to reach the development level indispensable to maintain the rate of current rate of globalization and implementation of 4.0 industry solutions. Therefore, exporters and importers as well as international economic organizations such as: WTO, WEF, OECD, WB, IMF, UNCTAD and other, are forced to take further efforts actions in order to accelerate these processes. The activities focus on identifying the possibilities for further facilitation of the world trade services. The activities mainly involve limiting or eliminating the existing administrative, customs, tax and fiscal, and other border barriers, including transport and logistics ones.

The latter constitute the main subject of research. The aim of research is to identify in detail those components of transport systems falling within their real and regulatory scope, which become factors limiting the effective operation and development of logistics macrosystems, and consequently the logistics mega-system. They also constitute barriers for the development of international trade and transport as well as global economy which is strongly affected by the adverse effects of incompatibility between the transport mega-system and real needs of the world trade, resulting from difficulties in smooth commodity flows.

The basic research hypothesis subject to verification by the author involves the notion providing that it is necessary to intensify the investment-related activities as well as regulatory and coordination related activities within the area of transport and logistics on a global scale, in

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order not only to eliminate the existing barriers, but also to provide subsequent necessary facilitation instruments for the development of international trade and global logistics order. To fulfil the objectives of research and verify the research hypothesis the author applied the method of statistical analysis of data sourced from the reports of international economic organizations (WTO, WEF, UNCTAD, OECD). The results of research and findings are presented in the conclusion.

SINGLE EUROPEAN TRANSPORT AND LOGISTICS AREA

Since 1992, when the first White Paper on transport policy was issued, the EU has been working steadily to implement the adopted Treaty provisions. After 2011, the activities are concentrated on developing the Single European Transport Area (SETA), based on the previously defined and implemented principles of transport market operations [EC COM 2011]. SETA is the area covering the network of transport infrastructure within the EU Member States' transport systems, rendering transport services and performing other related activities, such as: forwarding and logistics. Its territorial scope covers a group of gradually integrating transport macrosystems within Member States, which evolve towards full, real integration, i.e. based on the formula of consolidating transport markets within the currently developed single European transport area [EC DG 2018 and EC 2016 a].

The European transport area, perceived in such way, in its territorial and economic aspect, is an integral and important component of the European logistics area. It affects the European logistics area, both indirectly and directly, co-developing its basic parameters of technical and operational efficiency and concurrently determines, in a sometimes decisive manner, its effectiveness. This, in turn, defines the quality standards of transport area and its standing within the global logistics area, i.e. logistics mega-system. On the other hand, both logistics macrosystems of the EU Member States and the logistics mega-system, by defining real transport tasks to be performed by transport macrosystems, determined quantitatively and qualitatively, exert significant impact on the form as well as efficiency and effectiveness of the European transport area operations. Thereby, they determine directions and pace of growth of the European transport sector in all aspects, co-developing the structure and qualitative standard of the European transport and logistics area [Ponthieu 2008, MWD 2018].

In the framework of common logistics standards of handling the flow of goods and the development of global supply chains and networks, this area has strongly been anchored in the global system of logistics area. Therefore, the European area developed based on gradually progressing real integration of TSL sector in the EU, based on the formula of consolidating its

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markets with commodity markets, generates the qualitative new development impetus of the logistics mega-area, integrating the markets of global TSL sector under single international standard. It facilitates and improves the global trade transport services, rendered under logistics standards of the efficiency of commodity flows in global economy [Branch 2009, MDS 2018, MWD 2019 and EC DG 2018].

Therefore, the Single European Transport Area, defining spatial boundaries and development potential of the European logistics area, also co-determines to a significant extent the efficiency and effectiveness of its supply chains and networks covering all types of markets. At the same time, these chains and supply networks provide order in all types of flows within these markets, optimizing them as per time and costs. The fundamental factor linking them physically and integrating the flows is the transport and logistics infrastructure spread within the transport chain system, anchored in the logistics and transport infrastructure systems of particular EU Member States and regions [Wilson 2013, Schade et al. 2010].

TRANSPORT SYSTEMS AS COMPONENTS OF LOGISTICS SYSTEMS

The transport system is a system, organized in its operational and spatial as well as organizational and technical aspects, covering mutually connected transport sub-systems operating under the existing technical infrastructure relevant to this sector of network industries. Thus, it is a multidimensional complex structure where the elements of time and space play an extremely important role [Grzelakowski 2010, EC DG 2018].

The transport system must be coherent, which requires proper integration of particular sub-systems and coordination of activities as well as harmonization of its legal and regulatory capacity. Since only then the system may preserve its flexibility as well as efficiency and effectiveness of operations within the internal system and within its numerous relations with the environment, i.e. with other economic systems, and transport and logistics systems of neighbouring countries. In this context the key role in assessing the efficiency of transport system operations pertains to transport infrastructure – its quality. In this regard, the transport system can be defined as a coherent system of transport infrastructure network and carriage capacity with the system of commodity and passenger flows benefiting from this network at a given time [EC CEF 2018 and EC 2014, EC 2016].

In describing the transport system and its particular sub-systems, namely the system of transport sector real area, one shall indicate particular role of this sector in ensuring the efficient and effective implementation of economic processes at the stage of delivery, production, distribution and return. In all these processes and stages of developing the value for final

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receivers of products, transport plays a key role, qualifying and co-developing the level of value added generated by particular stages of managing within the existing internal and external international value chains [WTO 2017, Mandryk 2011].

The value chains, perceived in this way, must be based these days on the flow formula, i.e. logistics standards; therefore, they should operate in line with the concept of commodity flow optimization in terms of time and costs. As a result, they develop particular standards of rationality in selecting the form as well as means of transport, and concurrently standards of using the existing substantial and human resources of the transport sector [Branch, 2009].

Therefore, the logistics standards and the related decisions regarding transport choices made by market operators – including logistics operators, exert *eo ipso* significant direct impact on the transport market operations, efficiency of their mechanism of demand absorption and demand satisfaction. Thus, the transport system, with typical system of markets, analysed in the context of logistics and network – may facilitate or hamper the performance of logistics tasks defined by the supply chain and network operators, focused on developing the proper level of values within the logistics supply chain. [Mangan et al. 2009].

Therefore, the system should always be perceived as an integral component of a larger structure, namely the logistics macrosystem [Chopra and Meindel, 2010]. The place of transport system within the logistics macrosystem is presented in a demonstrative manner in fig. 1.

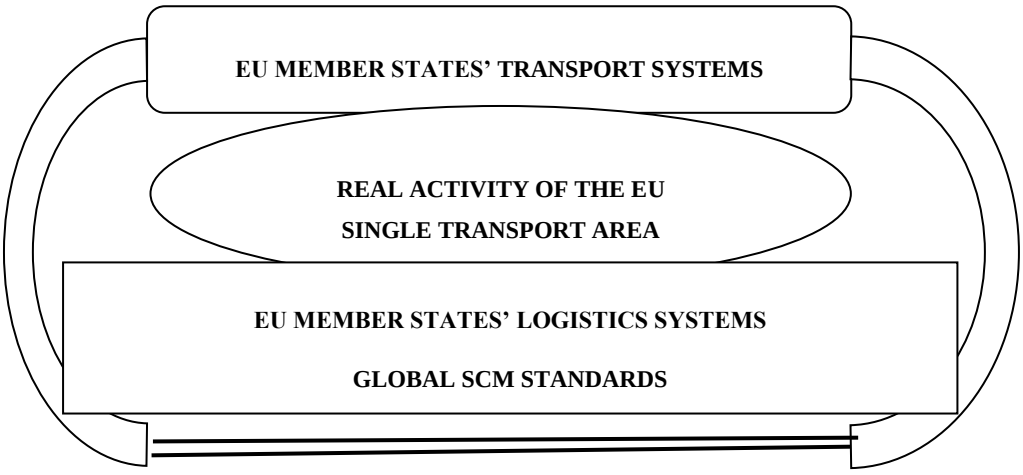

Fig. 1. Transport system as integral components of logistics macro-system
Source: Own work

The logistics macro-system is a spatially broad economic structure, covering the centres of production and consumption as well as places of goods shipping and receiving, i.e. source of generating the commodity flows and their output, managing numerous substantial flows

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handled physically by the transport system. The transport system facilitates the performance of logistics tasks defined by the supply chain and network operators, constituting an integral part of the logistics macrosystem of each country. From such a perspective, typical of the concept based on the formula: *transport in logistics,* the transport system in its operational and spatial as well as technical and organizational form should be subject to the efficient and effective performance of tasks and economic processes in all subsequent stages of broadly understood economic activity, i.e. at the stage of delivery, production, exchange and consumption. The activity is performed in the logistics macro-system [Global Insight 2016].

The logistics system perceived from the substantial and operational perspective covers the commodity markets – both supply and sale, as well as the TSL sector markets. From such a perspective, the logistics system is a deliberately organized and connected group of elements – its sub-systems, such as: delivery (suppliers), production, transport, distribution, storage, recipients – with the existing relations between them and between their assets, qualifying the flow of commodities, financial resources and information as well as returns (*reverse logistics*)[Mangan et al. 2009].

Whereas from the perspective of processes, the logistics macrosystem can be defined as continuous flow of raw materials, materials and read-made products from their places of origin, storages, production plants, distribution and wholesale warehouse chains as well as logistics centres to the final recipient of these commodities [Chopra and Meindl 2010].

The most important function in the national logistics system, i.e. logistics macrosystem, defining the boundaries of the logistics area, is performed by the transport system spread within the economic area of this country. The system is the addressee of various transport needs resulting from the necessity to meet the demand developed within the commodity markets – both supply and sale markets (see fig. 1), which shall be efficiently and effectively met as per time and costs [Grzelakowski 2018]. The needs are presented to the transport infrastructure managing entities, namely network service operators, indispensable for transport operators to render their transport, and, to a significant extent, to carriers with efficient means of transport providing transport services based on their access to transport infrastructure and suprastructure and proper logistics infrastructure [Ponthieu, 2008, p. 9].

It means that the demand is oriented to the network service markets as well as other markets, of the so-called operational transport services. Both the suppliers of network services and the producers of other types of transport services falling within the range of broadly understood logistics services should offer services of the highest qualitative parameters. Since such services define the quality standards not only of the transport area in a particular country,

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but also of the logistics area, by defining its efficiency and performance on the national (efficiency of commodity flows) and international level (within the EU), i.e. in the area of developing facilitation instruments in international trade as well as developing and sustaining the economic competitiveness [EC COM 2016].

TRANSPORT SECTOR AS A FACTOR DEVELOPING THE EFFICIENCY AND QUALITY OF THE EU LOGISTICS AREA

The effectiveness of the EU Member States' economies, including their competitiveness as well as efficiency in handling the trade with particular foreign economic macrosystems, is determined by numerous factors. Among them, at the time of industrial revolution 4.0, a group of transport and logistics related factors are becoming increasingly important. Due to lack transport infrastructure meeting the required global logistics standards, and necessary network capacity, its expected technical and operational coherence, low quality of network and transport as well as logistics services, the economy and international trade, the driving force of its development, fail to achieve the potential results. Therefore, the underdevelopment of transport macro-systems – in their quantitative and qualitative aspects, becomes the barrier for the development of logistics macro-systems, and consequently the economies of countries suffering from such constraints, leading sometimes to significant reduction in the scale of benefits they could draw from participating in the international division of labour [MDS 2018, WEF 2017].

Such barriers are identified by specialized international economic organizations and associations (fora) analysing their grounds and effects and indicating necessary reparatory measures. In this context, particularly important are: the World Trade Organization (WTO), the World Economic Forum (WEF) and the World Bank (WB). In analysing their seasonal reports and statements as well as specialized publications with a number of detailed indices one can identify these factors – in the practice of potential transport and transport-related barriers, and define activities necessary to their reduction or elimination.

By conducting research on the competitiveness of economies on a global scale since 2005, the World Economic Forum, under detailed surveys and analyses of macroeconomic indices of usually about 140 countries in the world, provides annually a detailed report (*The Global Competitiveness Report - GCR*), presenting the ranking of particular countries developed under the so-called Global Competitiveness Index - GCI. [WEF 2019] This is the most thorough as well as reliable report in the world, meticulously developed regarding the methodology and content-related aspects, provided under the supervision of prof. K. Schwab (WEF) and prof. X. Sala-i-Martin (Columbia University). GCR contains detailed characteristics of each country,

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namely its profile with the developed set of statistical data, indispensable for calculating the competitiveness indices and developing the global ranking. The competitiveness is defined as an external effect of joint activity of a number of institutional, political and other, e.g. economic factors defining the efficiency of each country on a global scale. The level of competitiveness is measured by applying as many as 114 factors aggregated in 12 pillars (groups), which co-determine the competiveness to a different degree, scored within the range from 1,00 (min) to 7,00 (max). Among them, the important second place refers to widely understood technical infrastructure – including transport infrastructure, constituting grounds for the national network industries (see fig. 2). On that basis, 114 detailed indices within this range are calculated; they constitute the statistical base applied to determine the synthetic index for each country (GCI).

Fig. 2. Set of factors defining the global competitiveness index of economies
Source: [WEF 2019]

In the group of factors within the infrastructure grouping (pillar 2), the key importance is attached to the technical infrastructure of transport and telecommunications. It is assumed that in each country they form the main transport and logistics base by determining the competitiveness level of economies on a global scale and consequently define, to a large extent, the competitiveness of global economy. Under this criterion only, included in the global competitiveness index, as an aggregate of correctly weighted factors, the ranking of economies of particular countries is also provided, by categorizing them by the level of competitiveness of their transport infrastructure systems [Global Insight 2016].

The networks of transport infrastructure and the quality of transport and logistics services affect not only the economy competitiveness level, but also the efficient flow of commodities in international trade. They can facilitate the trade in goods or constitute a significant barrier to

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handling the trade. Therefore, within the Enabling Trade Programme, supported by WTO ("Bali Package") and the World Economic Forum's Supply Chain & Transport Industry Partnership, *The Global Enabling Trade Report* is developed annually since 2008. The report defines the basic factors which determine the level of benefits the countries may draw from their participation in the global division of labour [WEF, 2017]. By means of the developed synthetic index based on the standard of WTO and WEF - ETI (*Enabling Trade Index*), the report provides the ranking of countries in terms of provided trade facilitation instruments. ETI, comprising a number of single partial indices, including partial index C – infrastructure (fig. 3), reflects the selected types of facilitation instruments, presenting thereby the level of facilitation, existing in a particular country, regarding the system of commodity exchange.

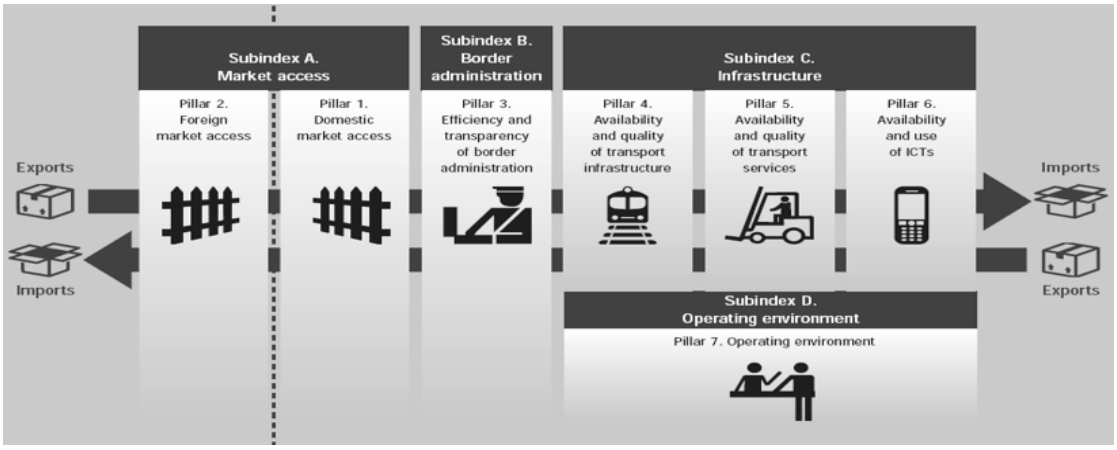

Fig. 3. Synthetic index of trade facilitation instruments – its structure and framework of partial indices
Source: [WEF, 2017].

A relatively significant level of importance in terms of determining ETI is attributed to subindex C, recognising that the quality of logistics, transport availability and efficiency of border administration are more important in providing trade facilitation instruments and defining costs of exchange than customs tariffs. The index defining the level of facilitation in terms of handling the commodity exchange from the perspective of trade and logistics conditions (subindex C – infrastructure), comprises a group of 19 properly weighted indices defining three main aspects of this parameter. They include: 1. availability and quality of transport infrastructure (railroad, road, air and seaport) – 7 indices in total, 2. availability and quality of transport services, including the presence and competences of logistics and transport companies and ease, timeliness and cost of shipment – 6 indices in total, 3. availability and use of information and communications technology (ICT) and quality of these services – 7 indices [WEF 2017].

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Based on each of the abovementioned partial indices as well as the overall subindex C, the ranking of particular countries is provided, regarding their commodity efficiency and the final ranking is presented, taking into account all other factors defining the achieved level of trade facilitation.

In the comparison of international standards, both quantitative and qualitative, between the logistics macrosystems anchored in the transport area of particular countries, analysed in terms of their impact on the economy competitiveness and efficiency in handling international trade, are also evaluated by means of the Logistics Performance Index - LPI). The indices are developed by the World Bank, providing the ranking of countries in terms of their achievements in implementing the most important logistics standards. The indicators reflect the weighted average of the achieved results resulting from evaluating the said efficiency in all 160 countries. Apart from the synthetic index LPI, the ranking of countries also includes a set of indices calculated for each of the 6 separate areas of logistics co-defining its efficiency (they fall within the range from 1 – the lowest level to 5 – the highest). The evaluation covers six basic fields – areas of logistics activity which determine the said efficiency. They include: 1. efficiency of border procedures – including customs clearance (rate, simplicity, predictability), 2. quality of transport infrastructure important for handling international trade, 3. ease of negotiating and arranging competitive prices, 4. quality of logistics services and competence of companies rendering such services (transport and logistics operators, forwarders, customs agents, brokers, etc.), 5. ability to track and trace consignment real-time, 6. timeliness of shipments in line with the scheduled or expected deadline. [WB IBRD 2018].

The rankings of countries presented by the World Bank, regarding the obtained level of logistics efficiency measured by LPI parameter, apart from the synthetic indicator, also take into account a set of partial indices, calculated for each of the 6 separate fields, co-defining LPI, also falling within the range from 1 to 5. The ranking for 2014 is presented in table 1.

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Table 1. Eight logistically most efficient countries in the world in 2018

Economy	Mean LPI rank	Mean LPI score	% of highest performer	Customs		Infrastructure		International shipments		Logistics quality and competence		Tracking and tracing		Timeliness	
				rank	score	rank	score	rank	score	rank	score	rank	score	rank	score
Germany	1	4,19	100,0	1	4,09	1	4,38	4	3,83	1	4,26	1	4,22	1	4,40
Netherlands	2	4,07	97,2	3	3,97	2	4,23	6	3,76	2	4,12	7	4,08	6	4,30
Sweden	3	4,07	97,2	4	3,95	3	4,22	2	3,88	5	4,04	11	4,02	4	4,32
Belgium	4	4,05	96,9	13	3,74	10	4,03	1	3,97	3	4,10	4	4,11	2	4,40
Singapore	5	4,05	96,9	2	4,00	5	4,14	8	3,72	4	4,08	8	4,05	3	4,34
United Kingdom	6	4,01	95,7	8	3,85	7	4,09	10	3,69	7	4,04	5	4,10	5	4,32
Japan	7	3,99	95,3	5	3,91	4	4,19	14	3,61	8	4,03	9	4,03	9	4,24
Australia	8	3,99	95,2	14	3,71	8	4,07	5	3,78	6	4,04	2	4,13	11	4,22

Source: [WB 2018]

The data in table 1 proves that four European countries (EU) reached the highest level of logistics efficiency in the world, outrunning USA (rank 10), Hong Kong (rank 9), Japan (rank 7) and Singapore (rank 5). In total, today the first 10 highest score countries comprise as many as 6 logistics macrosystems originating from the European countries. Interestingly, their standing regarding the logistics efficiency measured by the synthetic index LPI fails to coincide with their position in the list of countries offering the best facilitation of international trade, and sometimes with their standing regarding the set of transport and logistics subindices within ETI ranking.

EU MEMBER STATES' LOGISTICS MACROSYSTEMS AGAINST THE CHALLENGES OF GLOBAL LOGISTICS AREA. TRANSPORT BARRIERS TO THEIR DEVELOPMENT

The transport infrastructure and the quality of transport services as well as the progress in the development of modern information and communications technologies in the transport sector, namely the achieved level of digitalisation defining directly the digitalisation of supply chains as factors developing the quality of logistics macro-area, are particularly important for the logistics macrosystems of the EU Member States of the highest share in the global trade. However, these countries, included in the category of global economic leaders which thanks to the technologically developed and innovative economies draw significant benefits from the participation in the international division of labour, not always provide the performance and efficiency of their transport and logistics macrosystems, adequate for their standing in the world trade. The existing differences and sometimes even significant asymmetry can be observed by comparing the position, based on the ranking developed by WTO, of a particular country in the

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global trade (share in the world export) with the position in the rankings of transport efficiency – quality of infrastructure as well as network and carriage services, and widely understood logistics efficiency. The issue is presented in the below-mentioned specification, presenting indirectly, based on the calculated partial indicators of transport efficiency, both strong and weak points of the transport systems and consequently the logistics systems of the main leaders of global and the EU economy, defining the challenges they face in this respect (table 2).

Table 2. Ranking of selected EU Member States and other leading global driving forces of global economy in the category of their competitiveness as well as transport performance and logistics efficiency (status as at 2018).

Country	HG	GCI	GCI-Inf./ Tran. Inf.	ETI	ETI-Inf.	ETI-AQTS	LPI	LPI –Inf.
China	1	28	36/24	61	12	32	27	24
USA	2	2	13/12	22	7	14	10	6
Germany	3	7	8/7	9	8	6	1	1
Japan	4	6	5/4	16	5	9	7	4
Netherlands	5	4	2/2	2	9	4	2	3
France	7	15	9/10	13	4	17	15	12
Italy	9	30	18/17	36	22	34	21	20
United Kingdom	10	9	11/11	8	10	11	6	7
Spain	17	23	7/9	15	6	23	18	22
Poland	22	37	25/25	31	47	37	31	40

Key: HG – rank in the global trade (based on exports), GCI – rank in the global competitiveness (based on Global Competitiveness Index), ETI – position in the global ranking of trade facilitation instruments based on the Enabling Trade Index, LPI – Logistics Performance; GCI-Inf. – evaluation of the infrastructure development level in terms of its impact on the country competitiveness, GCI – Tran. Inf. - ETI-Inf. – availability and quality of transport infrastructure, ETI-AQTS – availability and quality of transport services, LPI–Inf. – transport infrastructure as a factor defining the level of the country logistics efficiency/performance.

Source: [Developed under reports by: WTO, WEF, WB, UNCTAD, OECD, 2018].

The analysis of data presented in tab.2 unambiguously proves the existing disparity between the transport and logistics systems of the analysed countries as well as their efficiency and quality regarding real needs and requirements defined by the volume of trade with foreign countries. The disparities are particularly visible in the case of China, Italy and France. They indicate the transport and consequently logistics barriers existing in these countries, limiting the scale of benefits the countries could potentially draw from the trade development and full

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participation in the international division of labour. As a result, it is reflected in the level of competitiveness of these economies on a global market.

The absolute and globally unquestionable leader in developing trade facilitation instruments and highly efficient transport and logistics services is Singapore. However, the relatively balanced relations in the analysed areas can also be observed in Germany, Netherlands, Great Britain, Japan and USA. Therefore, these countries of highly developed systems as well as transport and logistics markets, coherent with the framework of commodity markets, achieve not only significant competitive advantage, but also indispensable potential to capture the total financial and economic effects of their participation in the international division of labour. Consequently, the elimination of transport barriers, a long-term process difficult to perform due to significant capital intensity of such activities and inability to coordinate them on a global scale, is in the interest of each country and global economy as an open economic macrosystem providing more opportunities for development.

CONCLUSIVE REMARKS

The obtained results of research indicate that on a global and regional (EU) scale there are still numerous transport barriers of infrastructural as well as organizational and operational, and regulatory character in the transport systems of the significant majority of countries in the world. They limit not only the efficiency and effectiveness of operations within the transport sector and logistics macrosystem of those countries, and consequently their competitiveness on a global scale, but also hinder the development of global economy. The results allow to formulate general conclusion providing that at the current stage of global economy development – at the time of industrial revolution 4.0 and dynamically progressing digitalisation, one shall take coherent and coordinated investment-related and regulatory activities on the international level, stimulating the development of transport macrosystems in the EU and on a global scale. Since they become important components qualifying the increase in competitiveness of economic macrosystems, and concurrently ensuring the expected level of international trade facilitation as well as the required efficiency of the logistics macro-area. Only in this way can grounds for transport order, and consequently the logistics order be established, in the framework of regional and global economic area.

The conducted research also allows to formulate two recommendations:

1. in order to maintain high competitiveness of the EU and Europe, and first of all, ensure their development, it is necessary to ensure further growth of the efficiency and effectiveness of the European Transport Area, i.e. effectiveness of operations of transport

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macrosystems exerting significant impact on the performance of logistics area in these countries and the EU as a whole,

2. the development of high quality, smart transport infrastructure is a crucial factor ensuring the said growth, which is going to contribute to the increase in the quality of transport services and logistics standards in the EU Member States, translating into the increase in the competitiveness of these countries on a global scale.

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