

## LOGISTICS ATTRACTIVENESS OF POLAND IN RELATION TO LOGISTICS CENTRES AND GLOBAL COMPETITION

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**Abstract:** The aim of the study was to assess the attractiveness of the Polish logistics to internal and external investors in the dimension of national, international and global circumstances, with a focus on the creation of logistics centres. Apart from the generally available statistics, the study used indicators of logistics efficiency, the Business Process Outsourcing Index, the Shared Service Location Index and the Global Service Location Index. The analyses carried out were the basis for identifying areas for improvement in order to increase the efficiency of Polish logistics against global competition. Based on the results obtained, against global markets, Poland has been evaluated as attractive for the implementation of logistics activities mainly in terms of technical infrastructure and delivery times. At the same time, against European competition, Poland is currently one of the most attractive locations in terms of renting warehouse and logistics due to the location of logistics centres in central Poland.

**Key words:** logistics performance, logistics centres, the LPI, outsourcing, offshoring

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### Introduction

The economic turbulence that has occurred in the last few years determine a particularly difficult period to take on new challenges and business decisions. This, in turn, forces the search for such geographic locations in which the execution of business processes is burdened with as little risk as possible at the lowest cost of logistics operations. *"Logistics and supply chain performance is a vital aspect in the supply chain management of any organization today and with the age of globalization; competition has taken the world stage"* (Sorooshian et al., 2013).

Logistics centres are seen as a factor in the economic development of the region enabling efficient movement of services, goods and information, marking a crucial point of the development of modern logistics chains. At the same time, the creation and improvement of centres of this type is conditioned by the location of the region, convenience of legal or economic regulations in the country, etc.

This in turn affects the availability of logistics centres for external and internal entities, which is important to ensure continuity of flow in the supply chain on an international and global scale. The number and distribution of logistics centres

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in the distribution network have a direct impact on the cost of the final product (Tomić et al., 2014). Research conducted by Hilmola and Lorentz made it possible to specify the ten most important criteria for optimal location of centres, including (Chen and Notteboom, 2012):

- „road transportation connection,
- low distribution costs,
- assembly/manufacturing plants near-by,
- infrastructure support for intermodal transportation,
- third party logistics solutions are widely available,
- inbound logistics are easy to connect,
- low cost labour,
- railroad connection,
- future expand potential,
- company specific warehouse available for lease/rental”.

According to a report developed by Prologis in cooperation with Eyefortransport (Logistics centres ..., 2016), central Poland is the most desirable location for the development of logistics centres in Central and Eastern Europe, where the main factor of an area attractiveness are low labour costs, availability of labour and the availability and low prices of investment land (Ślusarczyk and Golnik, 2015).

On the other hand, R. Krajewska and Z. Lukasik consider the attractiveness of Poland in the sector of TSL services within the field of developing a marketing strategy. The authors, providing an assessment based on the M.E. Porter's five forces analysis and scoring for attractiveness of the sector, perceiving the logistics attractiveness as "the creation of a competitive situation which leads to increased investment in the sector by capital inflows of external entities or investments of the existing suppliers" (Krajewska and Lukasik, 2013).

The deliberations also include a report prepared by the Institute for Market Economics (Nowicki, 2015) which assessed the investment attractiveness of Polish regions and subregions, considering, inter alia, transport availability. The authors specify facilitating and reducing the cost of supplies and the provision of passenger transport as key determinants of the attractiveness of the country's transport.

Favourable trends are also recorded in the growth in demand for storage real estate in the country, more than 680 thousand m<sup>2</sup> of warehouse and industrial space was leased in the first quarter of 2016, the best result in the last decade (Olszewski and Ciupek, 2016).

Based on the above considerations, a country's logistics attractiveness is perceived as ensuring proper technological, technical, legal and economic environment for business development (Kadlubek, 2011). Ensuring appropriate conditions for the implementation of logistics activities, including the creation of logistic centres affects a country's economic development, as well as it is in the interest of national and local authorities (Kot, 2014).

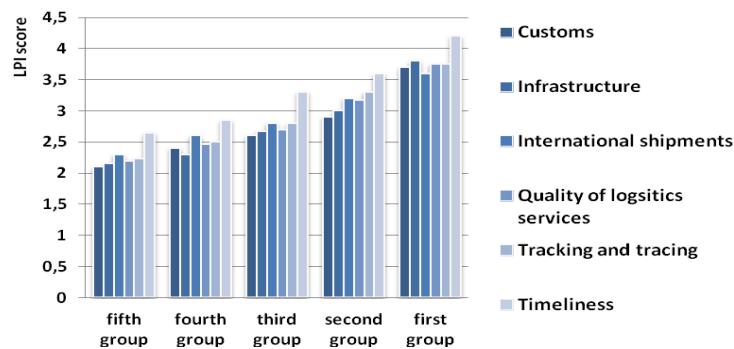
### Components of the Logistics Performance Index (LPI)

The complexity of the operation of supply chains, including logistics centres, including cargo, warehousing, border checks, payment systems, and many other functions, requires the implementation of a range of research, analysis and calculations. The decision about the creation of another logistics centre in the country seems to be difficult and long-term (Stević et al., 2015).

In order to facilitate this process, it is possible to use the Logistics Performance Index (LPI), whose task is to measure the efficiency of the supply chain in the country based on a survey conducted among carriers and shippers operating on a global scale. The LPI includes an assessment of six areas affecting the level of supply chain scalability (The World Bank, 2015), i.e.:

- infrastructure,
- customs,
- timeliness,
- international shipments,
- services quality,
- tracking and trading.

Cumulative results for individual areas enabled the division of the 160 countries studied into five groups of logistics performance (Figure 1).



**Figure 1. The scope of logistics performance of countries based on the distribution of the LPI results (Arvis et al., 2014)**

The first category of countries has the highest performance of the logistics supply chain, and therefore is perceived as "logistics friendly" and creates the best conditions for the creation and development of logistics centres. The second and third group are characterized by "partial performers" or "consistent performers". The last category of countries reached the lowest values of the LPI, therefore, it is seen as "logistics unfriendly".

### Assessment of Polish Logistics Performance against Global Competition Based on the LPI

According to a study conducted in 2014 Poland, for which the average value of the LPI is 3.49, is within the best logistically adapted group of countries, occupying the final 31 place. Ranking of the top-rated countries is presented in Table 1.

**Tabela 1. Ranking of countries with the highest logistics performance**  
(Arvis *et al.*, 2014)

Country	Rank	Score	% of highest performer
Germany	1	4.12	100
Netherlands	2	4.05	97,6
Belgium	3	4.04	97.5
United Kingdom	4	4.01	96.6
Singapore	5	4,00	96.2
Sweden	6	3.96	96.2
Norway	7	3.96	94.8
Luxembourg	8	3.95	94.4
United States	9	3.92	93.5
Japan	10	3.91	93.4
Poland	31	3.49	79.9

According to the LPI values, the best logistically-adapted countries are Germany, the Netherlands and Belgium, where individual components of the indicator were rated at least good. Poland, against the best countries in the world, realizes almost 80% of performance flows against world leaders. According to the German Report "Visions of the future; transportation and logistics 2030", "Germany is one of the world's most important logistics centres", while the Polish logistics market is in the construction phase (Clausen *et al.*, 2014).

Below, the first category of countries presents the most important indicators characterizing the countries with the greatest logistics performance on a global scale, including Poland (Table 2).

In the study group, three factors have greater values than the medium value of the overall LPI. The top assessment in this group was the one of the timeliness of the execution of logistics services, while the lowest assessment was the one of customs, which was related to the effectiveness of border checks and actions easily organize freight. Moreover, comparing the results of the logistics performance of individual areas to previous years, improvement of logistics conditions can be observed at least in almost every area under consideration. No significant improvement was only recorded in the case of logistics regulations. In the case of assessment of transport infrastructure elements, more than half of shippers highly or very highly assessed the level of water, rail and air infrastructure.

**Table 2. Selected indicators in the first category of logistics performance**  
(Arvis et al., 2014)

Deviation of the individual elements from the overall LPI in the given category	Customs		Infrastructure		International shipments		Services quality	Tracking and trading	Timeliness
	-0.15		0.05		- 0.22		0.00	0.02	0.32
Improvements of logistics performance in specific areas (% of responses)	Customs		Other border procedures		Transport infrastructure		ICT infrastructure	Private logistics services	Logistics regulation
	63		50		53		65	66	39
Percentage of high or very high assessment of individual infrastructure elements (% of responses)	Ports		Airports		Roads		Rail	Warehousing and transloading	Information and communications technology (ICT)
	61		66		57		29	68	81
High quality of logistics services (% of responses)	Road transport	Rail transport	Air transport	Maritime transport and ports	Warehousing, transloading, and distribution	Freight forwarders	Customs brokers	Trade and transport associations	Consignees or shippers
	69	31	71	67	71	71	71	58	47

Information infrastructure was especially often assessed highly. The least favourable was the assessment of railway infrastructure. Consequently, the quality of logistics services performed by individual branches and components of transport infrastructure has been mostly assessed as high, only in the case of rail transport and consignees and shippers, quality is rarely assessed highly.

### Individual KPIs for Poland

Poland, located within the first category of the LPI values, is characterized by high levels of efficiency in the supply chain flow. Below, individual indices are presented enabling the assessment of Poland in the framework of logistical efficiency. Analysing the LPI indicators for individual areas of logistics performance in Poland, a particularly high level of flow efficiency is recorded with respect to the frequency of deliveries on time. Transport infrastructure is assessed by shippers at the average level, which can result from the low level of development of railway transport.

**Table 3. Selected KPIs for Poland** (*Arvis et al., 2014*)

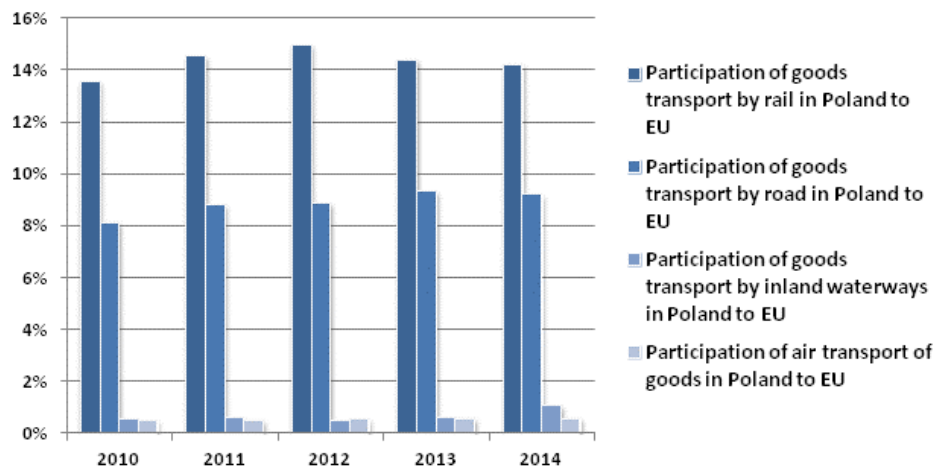
Customs	Infrastructure	International shipments	Services quality	Tracking and tracing	Timeliness	
3,26	3,08	3,46	3,47	3,54	4,13	
<b>Export time and cost</b>						
Port or airport supply chain			Land supply chain			
Distance (kilometres)	Lead time (days)	Cost (US\$)	Distance (kilometres)	Lead time (days)	Cost (US\$)	
301	1	707	3,500	46	2,000	
<b>Import time and cost</b>						
Port or airport supply chain			Land supply chain			
Distance (kilometres)	Lead time (days)	Cost (US\$)	Distance (kilometres)	Lead time (days)	Cost (US\$)	
300	2	500	3,500	46	3,000	
% of shipments meeting quality criteria	Number of agencies		Clearance time (days)		Physical Inspection (% of import shipments)	Multiple Inspection (% of shipments physically inspected)
	import	export	Without physical inspection	With physical inspection		
95	2	1	0	2	2	1

Assessing the effectiveness of exports by sea and air and land, it is clearly observed that shipping costs are much lower in the first case as well as the waiting time for delivery is shorter. The same is the situation in the case of transport of imports. At the same time, 95% of the deliveries carried out on Polish territory meet all quality criteria. Consignments are accompanied by a low percentage of customs controls, thus increasing the capacity of the supply chain.

### Transport Infrastructure

The transport infrastructure of a country and the availability of transport and air corridors are the natural focus of flows of goods and storage of goods, thus determining the location of logistics centres. Infrastructure development also provides the basic connectivity of international supply chains, facilitating the functioning and development of logistics centres. The level of use of infrastructure in the country against the background of the EU can be observed in the volume of cargo (Figure 2).

Analysing the level of the transport of goods in Poland in relation to the level of transport across the Union, it is recorded that railway infrastructure is the most commonly used for the transport of an average of 14% of the total of all cargos. Slightly less, more than 8% of EU goods are transported by road in Poland. Water and air infrastructure is the least used by shippers in comparison to other EU countries.



**Figure 2. The share of the freight volume of goods in Poland in relation to the total traffic realized in the European Union under the various modes of transport (%)**  
(Central Statistical Office, 2015; Eurostat)

### Assessment of the Outsourcing Business Potential in Poland and in EU Countries

Improvement of the logistics performance in Poland is also recorded within the Business Process Outsourcing (BPO) sector. The BPO Index and Shared Service Location Index enable the analysis of the following factors (Cushman and Wakefield, 2015): Customer Contact Centres, Shared Services Centres, Technical Support Centres, Sales, Marketing and Support, which should be considered when taking a decision on business processes outsourcing in the country. In terms of the attractiveness of outsourcing, Poland was ranked the 18th in 2015 among 36 countries selected from all over the world.

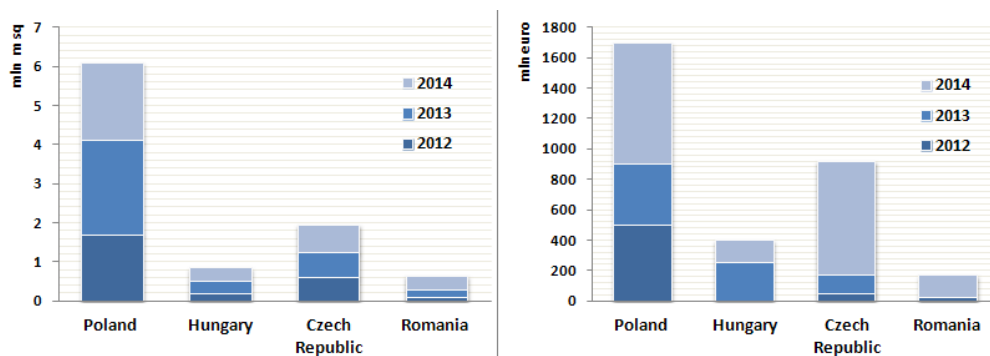
Table 4 presents the ranking of leaders and the location of Poland in each category of the BPO Index and Shared Service Location Index, as compared to selected EU countries of similar economic development.

One of the highest growth rates in outsourcing has been recently recorded by Vietnam. The average level of the overall BPO index places Poland further than Hungary, the Czech Republic and Romania in terms of the availability of outsourcing services. In the category of the best conditions for outsourcing services, Lithuania takes the first position, Poland is ranked as the 17th, offering an average level of language skills, business environment, communications and IT infrastructure. Analysing the costs of outsourcing, Poland is associated with relatively high labour, construction and rental costs, this category is dominated by El Salvador which deals with small changes in exchange rates. In the category of outsourcing business risks, Poland is burdened with one of the higher economic and political risks.

**Table 4. The BPO Index and the Shared Service Location Index in 2015** (*Cushman and Wakefield, 2015*)

Country	Overall	Conditions (include Talent / Labour Force, Business Environment, Time to First Supply, IT Infrastructure)	Costs (include Cost of Labour, Building Costs, Inflation, Property Costs)	Risk (include Economic Risk, Corporate Risk, Energy Risk)
Top countries	Vietnam	Lithuania	El Salvador	Canada
Romania	4	5	10	12
Hungary	9	9	20	15
Czech Republic	17	12	8	21
Poland	18	17	20	11

In comparison, other EU countries, with a similar economic development to Poland, offer less favourable technical conditions and higher costs of ordered activities, accompanied by a higher business risk. A similar indicator is suggested by the company of A.T. Kearney who, in turn, identified the Global Services Location Index for assessing the attractiveness of using offshoring based on the economic attractiveness of the country, the availability of adequate human resources and business conditions (research by A. T. Kearney, 2016). According to the ranking of 2016, Poland is ranked 10th in the world, gaining an advantage primarily over Germany or Britain. Figure 3 shows the size of warehouse space and the investments made in its development in Poland and selected EU countries.



**Figure 3. The size and level of investment in warehouse space in 2012-2014 in selected European countries** (*Poland and the leader in CEE, 2015*)

In recent years, Poland has had the largest warehouse area, as compared to the Czech Republic, Romania and Hungary. At the same time, as a result of the growth



of the lease index, the value of investments has increased, inter alia, for the construction of new logistics centres.

### Summary

The study showed that the high flow performance in the supply chain in Poland stems from its geographical location which provides access to sea and rivers. The high value of the LPI also highlights the dynamic development of road infrastructure and the reduction of customs procedures, thus affecting greater transport scalability.

The static analysis points to the fact that a significant participation of the total goods transported in the EU is transported in Poland by rail. The assessment of the implementation of Polish outsourcing business takes an average location in terms of locations for outsourcing services both in terms of technical and related costs. Definitely, the high economic, corporate and political risks affect the limitations of the BPO sector in Poland.

To sum it up, worldwide, Poland is one of the most attractive countries for national and international shippers and carriers. Simultaneously, striving for further development and catching up with the logistics of the most developed countries, such as Germany, the Netherlands and Belgium, requires taking up actions in the modernization of railway infrastructure, legal regulations in the field of construction law and better preparation of technological information facilities for the use of outsourcing. A major limiting factor conducting business in Poland is also its political situation that confuses potential investors. In order to increase the logistics attractiveness of Poland, there is the need for exploration and development of new forms of facilities for the current and potential shippers in line with internal country regulations, customs and standards.

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## ATRAKCYJNOŚĆ LOGISTYCZNA POLSKI W ASPEKCIE TWORZENIA CENTRÓW LOGISTYCZNYCH NA TLE GLOBALNEJ KONKURENCJI

**Streszczenie:** Celem badań było dokonanie oceny atrakcyjności logistycznej Polski dla wewnętrznych i zewnętrznych inwestorów w wymiarze uwarunkowań krajowych, międzynarodowych i globalnych, z ukierunkowaniem na tworzenie centrów logistycznych. Poza ogólnie dostępnymi danymi statystycznymi, w badaniach wykorzystano wskaźniki wydajności logistycznej, Indeks Business Process Outsourcing, Shared Service Location Index and Global Service Location Index. Przeprowadzone analizy stanowiły podstawę identyfikacji obszarów wymagających usprawnienia w celu zwiększenia wydajności logistycznej Polski na tle światowej konkurencji. W oparciu o otrzymane wyniki, na tle światowych rynków Polska oceniana została jako atrakcyjna dla realizacji działalności logistycznej głównie pod względem infrastruktury technicznej oraz czasu dostaw. Jednocześnie, na tle konkurencji europejskiej, Polska stanowi obecnie jedną z najbardziej atrakcyjnych lokalizacji pod względem wynajmowania powierzchni magazynowo-logistycznych z uwagi na lokalizację centrów logistycznych w centralnej Polsce.

**Słowa kluczowe:** wydajność logistyczna, centra logistyczne, wskaźnik LPI, outsourcing, offshoring

### 物流中心在全球競爭中創造條件的物理吸引力

**摘要：**本研究的目的是評估波蘭物流對國內，國際和全球情況的內部和外部投資者的吸引力，重點是建立物流中心。除了一般可用的統計數據，研究使用了物流效率指標，業務流程外包指數，共享服務位置指數和全球服務位置指數。所進行的分析是確定需要改進的領域的基礎，以提高波蘭物流對全球競爭的效率。根據所取得的成果，針對全球市場，波蘭被評估為實施物流活動的吸引力，主要是在技術基礎設施和交貨時間方面。同時，由於在波蘭中部的物流中心的位置，波蘭在租賃倉庫和物流方面是目前最具吸引力的地區之一。

**關鍵詞：**物流績效，物流中心，LPI，外包，離岸外包