

COMPARATIVE ANALYSIS OF THE AVERAGE UNIT COSTS STUDY RESULTS OF INTERNATIONAL FREIGHT ROAD TRANSPORT COMPANIES SERVING EASTERN MARKETS AND EU COUNTRIES, IN THE YEARS 2009-2020

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Abstract:

The article forms the next part of the cyclical publications of the Transport Economics and Accessibility Laboratory (former Economic Research Laboratory) in the field of cost analysis of Polish enterprises of international freight road transport. It juxtaposes and compares the average unit costs of international carriers recorded in 2020 in relation to the results from previous years. The research covered both enterprises serving eastern markets and the European Union. The statistical characteristics of the surveyed entities were presented, taking into account their size, determined based on the size of the truck fleet used. It also shows the average costs of one vehicle-kilometre of mileage for a truck above 12 Mg GVW, depending on the size of the enterprise and taking into account the direction of transport. The structure by type of costs of the surveyed carriers was also analysed. Unit costs in 2020 in relation to the period 2009-2020 are presented in tabular and graphical form.

Keywords:

international transport, freight road transport, unit costs

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Introduction

The distinguishing feature of international road transport services provided by Polish carriers is their predominantly full-truck nature and the resulting advantage of a fleet with a GVW of over 12 Mg, with a universal body. The global COVID-19 pandemic, which has been going on

for over two years, has not significantly disturbed the structure of this transport sector. International freight transport was still characterized by cost differentiation due to the type of markets served. The rates and costs with respect to the eastern markets were different than in the EU markets. It should be assumed that due to the current war in Ukraine and its future and difficult to predict consequences, the costs of international transport will increase and the disproportions in them will deepen. This is mainly due to factors such as: the mass outflow of Ukrainian drivers from the operation of transport services performed by Polish transport companies, an increase in fuel prices, an increase in employment costs, as well as other expenditure resulting from the implementation of the provisions of the so-called Mobility Package. However, the average unit costs of one vehicle-kilometre of mileage still vary depending on the size of the enterprise and the direction of transport. Hence the interest in continuing the research in the area of international transport costs, which is confirmed by this article.

1. Characteristics of the sample and research method

The data, based on which this article was created was obtained as a result of:

- direct surveys (survey template – Appendix 1) at the selected companies providing international freight road transport services,
- research via the electronic form of the ITS survey.

The Association of International Road Carriers (ZMPD), with which the Transport Economics and Accessibility Laboratory has been cooperating for many years, had a key share in collecting data from international trucking companies. The obtained data was subject to a step-by-step validation and verification. Then it was entered into an electronic database, based on an original computer program. In total, 169 surveys regarding transport activity for 2020 were analysed. Out of the total sample, 85 concerned enterprises with a dominant share of transport serving EU markets, while 84 with a dominant share of transport serving eastern markets. The results of the presented cost research allowed to capture the trends of changes in the unit costs of transport. The exact characteristics of the analysed research sample are included in Tables 1-2.

Tab. 1. Characteristic features of the studied sample of international truck transport companies with a dominant share of transport serving markets of EU countries, operating rolling stock over 12.0 Mg GVW with universal bodies, participating in cost studies for the entire year 2020, according to the size of enterprises and weighted averages for the surveyed population

Specification	Measure units	micro (1-5) [PLN/vehicle-km]	micro (6-9) [PLN/vehicle-km]	medium (10-49) [PLN/vehicle-km]	large (50+) [PLN/vehicle-km]	On average
Average number of trucks	pcs.	3,1	7,0	23,3	82,8	23,2
Average number of employees in the enterprise	employee	4,0	11,4	33,8	102,3	31,1
Average number of drivers in the enterprise	driver	3,1	7,6	23,3	84,6	23,7
Average mileage of cars in the enterprise	thousand km	213,1	477,0	1359,5	5063,1	1428,1
Average mileage of one car in the enterprise	thousand km	68,7	68,1	58,3	61,1	61,6
Number of surveyed enterprises	pcs.	24	18	30	13	85

Source: Own compilation based on the ITS database on costs in truck transport companies (as of 2021/12/01).

Tab. 2. Characteristic features of the studied sample of international trucking companies with a dominant share of transport serving eastern markets, operating rolling stock over 12.0 Mg GVW with universal bodies, participating in cost studies for the entire year 2020, by company size and weighted averages for the examined group

Specification	Measure units	micro (1-5) [PLN/vehicle-km]	micro (6-9) [PLN/vehicle-km]	medium (10-49) [PLN/vehicle-km]	large (50+) [PLN/vehicle-km]	On average
Average number of trucks	pcs.	2,9	7,7	22,6	88,8	28,1
Average number of employees in the enterprise	employee	3,7	11,1	29,7	112,1	36,2
Average number of drivers in the enterprise	driver	2,9	7,6	22,8	88,6	28,1
Average mileage of cars in the enterprise	thousand km	171,9	517,7	1421,4	5208,6	1829,9
Average mileage of one car in the enterprise	thousand km	60,3	67,7	63,0	59,8	61,1
Number of surveyed enterprises	pcs.	20	18	29	17	84

Source: Own study based on the ITS database on costs in truck transport companies (as of 2021/12/01).

It shows that medium-sized enterprises accounted for the highest number of companies in the sample. This conclusion applies to both transports carried out serving the EU and eastern markets. In both cases, the smallest group was the group of large enterprises with a fleet of more than 50 vehicles, while the representativeness of large companies on the EU markets was even lower than on the eastern markets.

In the surveyed sample of entities with a dominant share of transport serving the EU markets, the statistical transport company in 2020 had an average of 23 cars with a GVW exceeding 12.0 Mg, with a universal body, and in the eastern markets 28 cars with the same parameters (Tab. 1 and 2). The average annual mileage of a truck used by companies operating on both markets was similar in 2020. Among the carriers serving

eastern markets, it amounted to an average of 61.1 thousand km, while on the EU markets – 61.6 thousand km. In 2020, the average employment in enterprises operating mainly in the eastern markets was 36.2 employees, and in the EU markets – slightly over 31.1 employees (Tables 1 and 2).

The distribution of the average employment of drivers in these groups was similar. Among enterprises with a dominant share of transport serving eastern markets, the average employment of drivers was 28.1, and on the EU markets – 23.7. This was followed by the distribution of the average number of trucks in both groups (Tables 1 and 2). Thus, the specifics of engaging the fleet and employment in both groups were similar, with a slightly higher fleet size and average annual mileage in the case of carriers serving eastern markets than those operating on EU markets.

Summing up, the average mileages of cars at the companies operating on both markets were similar, both in relation to the entire fleet of the analysed entities and per one vehicle.

2. Conclusions from the research

As shown by the data presented, the international road freight sector remained relatively healthy in 2020, despite the ongoing COVID-19 pandemic, both in the eastern and EU markets. Fluctuations in costs, revenues and margins were greater in the first half than in the second half of 2020.

In the last five years, the average annual increase in the unit cost of 1 vehicle-kilometre in the studied sample of enterprises was at a similar level (3.2%), although in 2020 the highest increase in the average unit cost of transport was recorded (an increase by 4.2% in the EU markets), but on the eastern markets, it was lower than in the previous years (an increase by 2.8%). In the entire analysed period of 2009-2020, the cost dynamics ratio was 156%. Margins showed high variability in 2015-2020, and their dynamics varied significantly depending on the markets served. In the last three years, the average margin has fallen on the EU markets (to 3.1%), while on the eastern markets its average annual margin has increased slightly (to 4.2%). The values of weighted average unit costs recorded on both markets in recent years are presented in Table 8 and Figures 9 and 10.

As a result of the research, differences in changes in costs were observed, resulting from: the serviced market, the size of the enterprise, and the cost category (see Figure 1-8). The profitability of enterprises, taking into account the differences for the geographic markets served, remained at a similar level, with the average annual profit amounting to less than PLN 0.16/vehicle-km, although with a regular downward trend for the EU markets (see Tables 8 and 9). It resulted from tightening of the regulations initiating the implementation of the so-called The Mobility Package, and to an even greater extent from the introduction of numerous restrictions and phytosanitary regulations regarding international transport during the COVID-19 pandemic (especially in the first wave). Both areas of regulation concerned EU markets in 2020, which clearly contributed to a decrease in average unit profits and margins on EU markets, as opposed to a slight improvement in this regard in transport on eastern markets (an increase in the average annual unit profit by 12%). This resulted in a decrease in the net profit margin in the EU markets by as much as 25% compared to 2019, and in the eastern markets its increase by 5%. Also, the average unit profit in the group of enterprises surveyed on the eastern markets increased from PLN 0.17/vehicle-km in 2019 to PLN 0.19/vehicle-km in 2020. In the group of companies operating on the EU markets, a 23% decrease in the average unit profit was recorded. This meant a deepening of the downward trend in the area of profitability of transport on EU markets. Compared to the period of 2009-2015, when the average annual profit for transport was in the range of PLN 0.35-0.38/vehicle-km, this means a nearly threefold decrease in profitability. One should not forget about the impact of the Russian embargo on the reduction of margins after 2014 in the entire group of companies studied, also in relation to transport on eastern markets, provided mainly by Polish carriers.

In the last five years, the average annual increase in the unit cost of 1 vehicle-kilometre in the studied sample of enterprises was at a similar level (3.2%), despite the disproportions in the distribution of the index values in both markets, in individual years (see Figure 1-2 and 5-6 and Table 9).

In 2020, the highest increase in the average unit cost of transport on EU markets was recorded (4.2%). In the entire analysed period of 2009-2020, the cost dynamics index was 147% and was lower, respectively, than its value for eastern markets (166%). High volatility in the period 2015-2020 was shown by margins on both markets, while for the EU markets it was a downward trend, and for the eastern markets – increasing. It resulted mainly from the declining profits on the EU markets, resulting from the introduced regulations and restrictions at the EC level (compare Table 9 and Figure 9-10).

In 2020, the average mileages of cars at the enterprises operating in both markets (EU and Eastern countries) was similar (see Table 1-2), both in relation to the entire fleet and a single vehicle. In the group of carriers operating on the EU markets in 2020 the average mileage of one vehicle increased slightly (0.4%), while in the group of companies serving eastern markets, a 2% increase in the average mileage of a vehicle was recorded in this period.

2.1. Average costs of 1 vehicle-kilometre and by type – EU markets

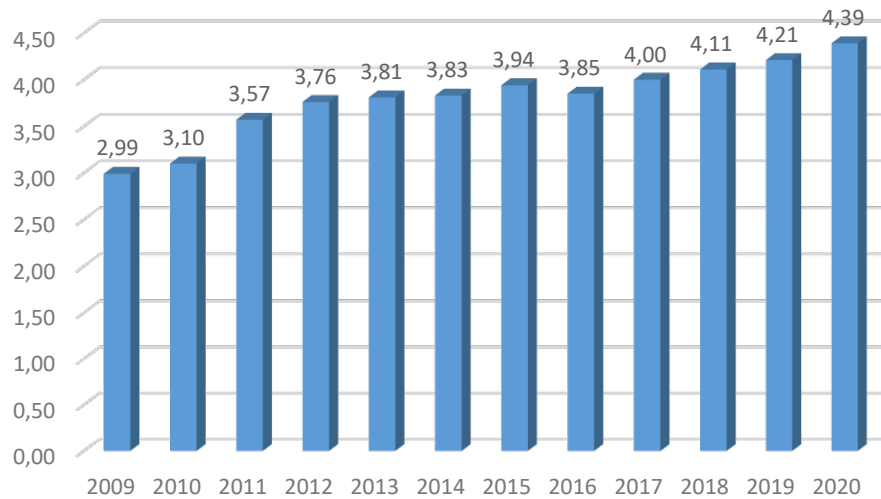
The results of research on the cost structure of truck transport companies operating in the EU markets are given in Table 3, and in the Eastern markets in Table 5. They take into account the size of transport companies, due to the numbers of the fleet vehicles and using weighted averages of the cost of 1 truck-kilometre in 2020 year, separately in both groups, due to the dominant markets served.

Table 4 and Figures 1 and 2 show the results of cost studies at the truck transport companies according to enterprise size groups and calculated as the weighted average costs of 1 vehicle-kilometre for the entire year 2020, for the entire sample of international transport companies with a dominant share of transport serving EU countries markets. Table 4 contains a detailed specification of the average unit costs of a vehicle-kilometre, taking into account their structure by type. The weighted average costs of 1 vehicle-kilometre in the group in question in 2020 amounted to PLN 4.39/vehicle-km. The results of research conducted in the period 2009-2020 are presented below:

- in 2020 4,39 PLN/vehicle-km,
- in 2019 4,21 PLN/vehicle-km,
- in 2018 4,11 PLN/vehicle-km,
- in 2017 4,00 PLN/vehicle-km,
- in 2016 3,85 PLN/vehicle-km,
- in 2015 3,94 PLN/vehicle-km,
- in 2014 3,83 PLN/vehicle-km,
- in 2013 3,81 PLN/vehicle-km,
- in 2012 3,76 PLN/vehicle-km,
- in 2011 3,57 PLN/vehicle-km,
- in 2010 3,10 PLN/vehicle-km,
- in 2009 2,99 PLN/vehicle-km.

They show that throughout the analysed period, the index of dynamics of the average cost of 1 vehicle-kilometre for transport on the markets of the EU countries was 146%. The dynamics of changes in individual categories of the cost of 1 vehicle-kilometre is shown in Figures 2 and 3, and their structure recorded in 2020 – in Figure 4.

Fig. 1. Average costs of 1 vehicle-kilometre of mileage at the surveyed international transport companies in the years 2009 – 2020 (universal rolling stock over 12.0 Mg GVW; markets of EU countries) [PLN/vehicle-km]



Source: own study based on the ITS cost database.

Tab. 3. Average costs of 1 vehicle-kilometre in total and by type of costs, size of enterprises and weighted average costs at the surveyed enterprises in 2020 (universal rolling stock; markets of EU countries) [PLN/vehicle-km]

Specification	micro (1-5) [PLN/vehicle-km]	micro (6-9) [PLN/vehicle-km]	medium (10-49) [PLN/vehicle-km]	large (50+) [PLN/vehicle-km]	Average weighted costs of 1 vehicle-km of mileage [PLN/vehicle-km]
Average costs of 1 vehicle-kilometre of mileage, including:	4,34	4,45	4,32	4,53	4,39
propellants and consumables	1,668	1,709	1,68	1,781	1,70
overhaul services, repairs and tires	0,121	0,2	0,107	0,142	0,12
depreciation or loss of the rolling stock market value	0,106	0,123	0,102	0,118	0,11
other capital costs (leasing, loan)	0,027	0,034	0,052	0,064	0,04
remuneration and drivers business trips and social insurance, down to the employer	1,275	1,312	1,212	1,281	1,26
transport means insurance and tax on fixed assets	0,499	0,529	0,517	0,537	0,52
road tolls	0,5	0,497	0,491	0,499	0,50
other costs	0,145	0,123	0,159	0,112	0,14
Number of surveyed enterprises	24	18	30	13	85

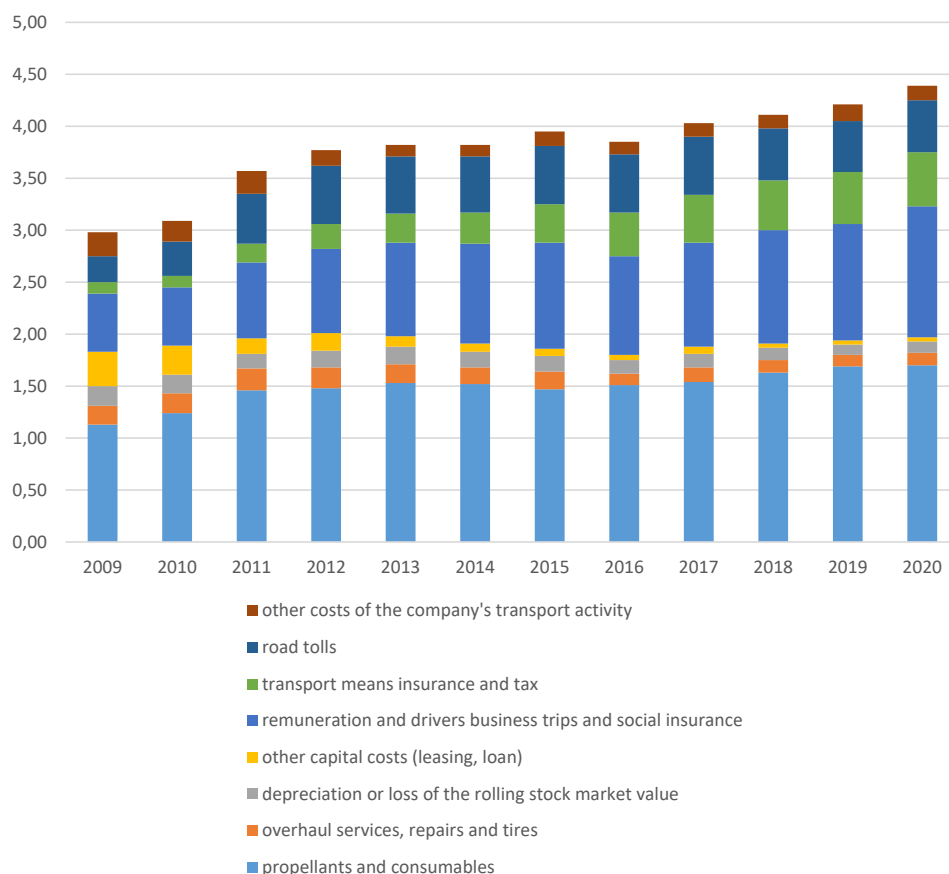
Source: calculations based on the ITS database on costs at the truck transport companies (as of 2021/12/01)

Tab. 4. Weighted average costs of 1 vehicle-kilometre of mileage in total and by selected types of costs in 2009-2020 at the surveyed truck transport companies operating rolling stock over 12.0 Mg GVW with universal bodies, licensed for international transport, with a dominant share of transport serving the EU countries markets

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Average costs of 1 vehicle-kilometre of mileage, including:	2,99	3,10	3,57	3,76	3,81	3,83	3,94	3,85	4,00	4,11	4,21	4,39
propellants and consumables	1,13	1,24	1,46	1,48	1,53	1,52	1,47	1,51	1,54	1,63	1,69	1,70
overhaul services, repairs and tires	0,18	0,19	0,21	0,20	0,18	0,16	0,17	0,11	0,14	0,12	0,11	0,12
depreciation or loss of the rolling stock market value	0,19	0,18	0,14	0,16	0,17	0,15	0,15	0,13	0,13	0,12	0,10	0,11
other capital costs (leasing, loan)	0,33	0,28	0,15	0,17	0,10	0,08	0,07	0,05	0,07	0,04	0,04	0,04
remuneration and drivers business trips and social insurance, down to the employer	0,56	0,56	0,73	0,81	0,90	0,96	1,02	0,95	1,00	1,09	1,12	1,26
transport means insurance and tax on fixed assets	0,11	0,11	0,18	0,24	0,28	0,30	0,37	0,42	0,46	0,48	0,50	0,52
road tolls	0,25	0,33	0,48	0,56	0,55	0,54	0,56	0,56	0,56	0,50	0,49	0,50
other costs of the company's transport activity	0,23	0,20	0,22	0,15	0,11	0,11	0,14	0,12	0,13	0,13	0,16	0,14
Number of enterprises examined	63	70	66	48	61	62	61	58	71	79	79	85

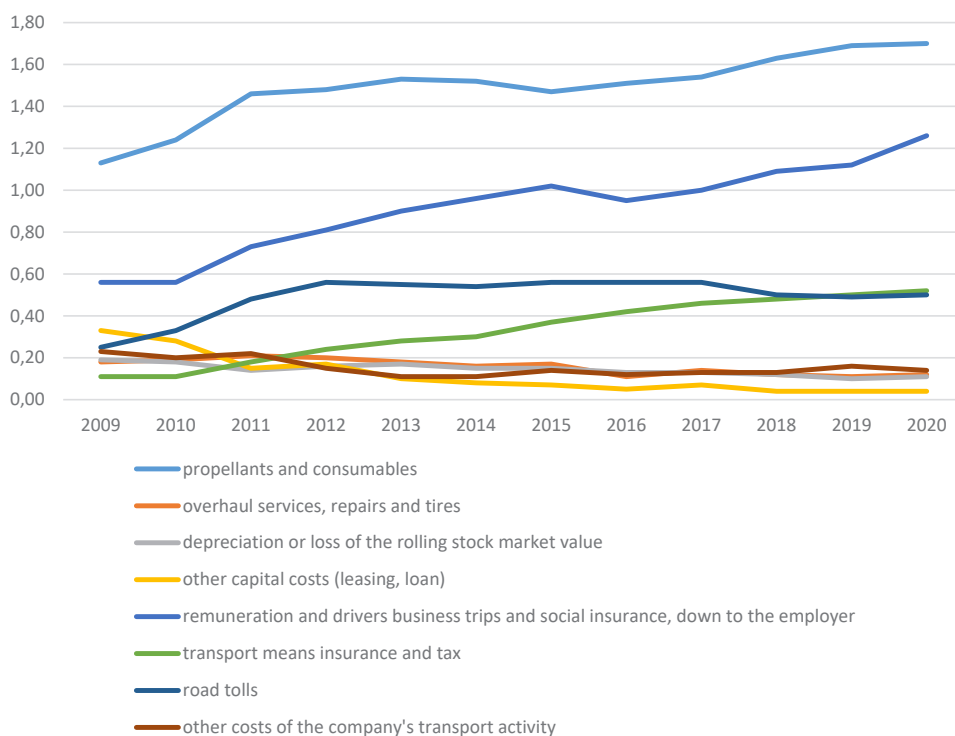
Source: calculations based on the ITS database on costs in truck transport companies (as of 2021/12/01)

Fig. 2. Average weighted costs by type of 1 vehicle-kilometre of mileage at the surveyed companies of international transport (universal rolling stock; over 12.0 Mg GVW; EU countries markets; 2009 - 2020) [PLN/vehicle-km]



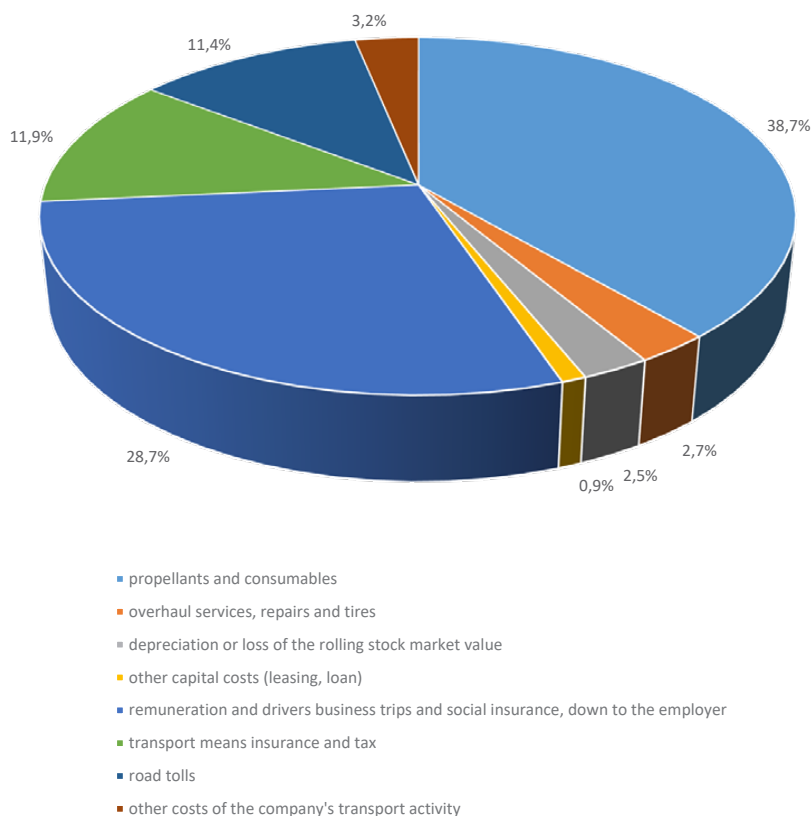
Source: own drawing based on data from Tab. 4

Fig. 3. Variability of average weighted costs of 1 vehicle-kilometre by type of costs at the surveyed international transport companies in 2009-2020 (universal rolling stock; over 12.0 Mg GVW; EU countries markets) [PLN/vehicle-km]



Source: own study based on the data in Tab. 4

Fig. 4. Generic structure by type of the average weighted cost of 1 vehicle-kilometre at the surveyed enterprises licensed for international transport in 2020 (universal rolling stock over 12.0 Mg GVW; EU countries markets) [%]



Source: own study based on the data in Tab. 4

2.2. Average costs per vehicle-kilometre and by type – eastern markets

Table 6 and Figures 5 and 6 show the results of cost studies at the truck transport companies by enterprise size groups and calculated as average weighted costs of 1 vehicle-kilometre of mileage for the entire year 2020 and for the entire sample of international transport companies with a dominant share of transport serving eastern markets. Table 6 contains a detailed specification of the average unit costs of a vehicle-kilometre, taking into account their structure by type. The average weighted costs of 1 vehicle-kilometre in the group in question in 2020 amounted to PLN 4.36/vehicle-km. The results of the research conducted in the period 2009-2020 are presented below:

• in 2020	4,36 PLN/vehicle-km,
• in 2019	4,24 PLN/vehicle-km,
• in 2018	4,10 PLN/vehicle-km,
• in 2017	3,99 PLN/vehicle-km,
• in 2016	3,83 PLN/vehicle-km,
• in 2015	3,49 PLN/vehicle-km,
• in 2014	3,61 PLN/vehicle-km,
• in 2013	3,64 PLN/vehicle-km,
• in 2012	3,68 PLN/vehicle-km,
• in 2011	3,36 PLN/vehicle-km,

- in 2010 2,66 PLN/vehicle-km,
- in 2009 2,62 PLN/vehicle-km,

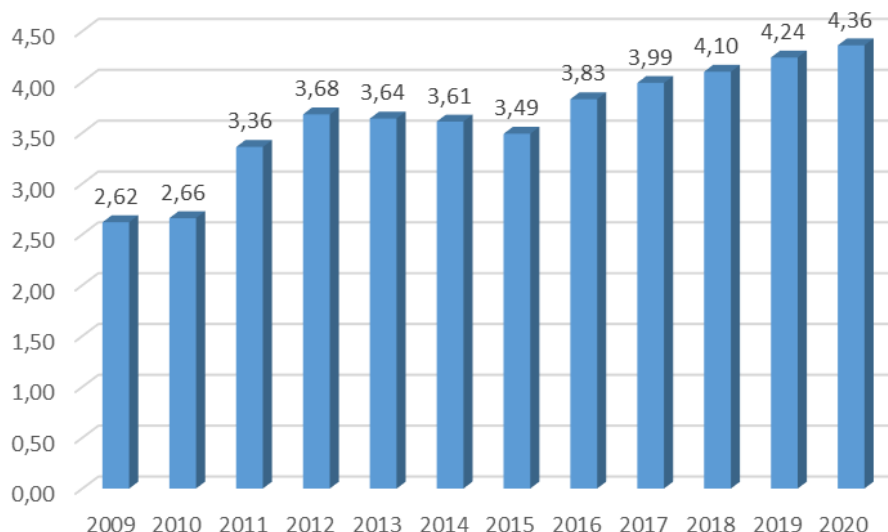
They show that throughout the analysed period, the index of dynamics of the average cost of 1 vehicle-kilometre for transport on the markets of the EU countries was 166%. The dynamics of changes in individual categories of the cost of 1 vehicle-kilometre is shown in Figures 6 and 7, and their structure recorded in 2020 – in Figure 8.

2.3. Comparison of the average unit costs of transport depending on the market

In the last two years, the costs of remuneration for transports on eastern markets were characterized by higher growth dynamics than those in the EU countries, which was related to the implementation of regulations preceding the introduction of the so-called Mobility Package. On the other hand, on the eastern markets, there was a clear increase in the remaining costs in comparison to the EU countries markets (see Figure 3 and 7).

When analysing the structure of the unit cost in 2020, a slightly higher share of fuel costs in the transports performed on the EU countries markets was recorded, than on the eastern markets (almost 3 percentage points).

Fig. 5. Average costs of 1 vehicle-kilometre of mileage at the surveyed international transport companies in the years 2009 – 2020 (universal rolling stock over 12.0 Mg GVW; eastern markets) [PLN/vehicle-km]



Source: own drawing based on data from Tab. 6

Tab. 5. Average costs of 1 vehicle-kilometre in total and by the type of costs, size of enterprises and average weighted costs at the surveyed enterprises in 2020 (universal rolling stock; eastern markets) [PLN/vehicle-km]

Specification	micro (1-5) [PLN/vehicle-km]	micro (6-9) [PLN/vehicle-km]	medium (10-49) [PLN/vehicle-km]	large (50+) [PLN/vehicle-km]	Average weighted costs of 1 vehicle-km of mileage [PLN/vehicle-km]
Average costs of 1 vehicle-kilometre of mileage, including:	4,23	4,51	4,33	4,41	4,36
propellants and consumables	1,55	1,668	1,577	1,644	1,60
overhaul services, repairs and tires	0,104	0,134	0,128	0,117	0,12
depreciation or loss of the rolling stock market value	0,11	0,118	0,125	0,12	0,12
other capital costs (leasing, loan)	0,018	0,043	0,047	0,062	0,04
remuneration and drivers business trips and social insurance, down to the employer	1,26	1,312	1,23	1,282	1,27
transport means insurance and tax on fixed assets	0,499	0,558	0,513	0,526	0,52
road tolls	0,417	0,441	0,439	0,433	0,43
other costs of the company's transport activity	0,276	0,233	0,276	0,226	0,26
Number of enterprises examined	20	18	29	17	84

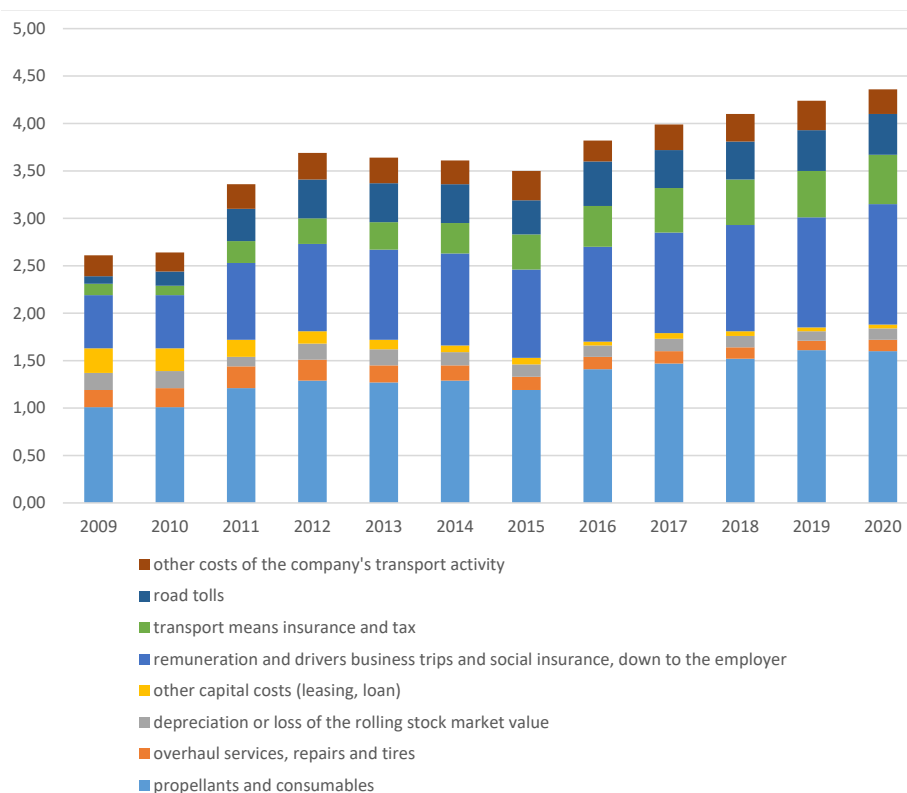
Source: calculations based on the ITS database on costs at the truck transport companies (as of 2021/12/01)

Tab. 6. Average weighted costs of 1 vehicle-kilometre in total and by the selected types of costs in the years 2009 – 2020 at the surveyed truck transport companies operating rolling stock over 12.0 Mg GVW with universal bodies, licensed for international transport, with a dominant share of transport serving eastern markets

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Average costs of 1 vehicle-kilometre of mileage, including:	2,62	2,66	3,36	3,68	3,64	3,61	3,49	3,83	3,99	4,10	4,24	4,36
propellants and consumables	1,01	1,01	1,21	1,29	1,27	1,29	1,19	1,41	1,47	1,52	1,61	1,60
overhaul services, repairs and tires	0,18	0,20	0,23	0,22	0,18	0,16	0,14	0,13	0,13	0,12	0,10	0,12
depreciation or loss of the rolling stock market value	0,18	0,18	0,10	0,17	0,17	0,14	0,13	0,12	0,13	0,12	0,10	0,12
other capital costs (leasing, loan)	0,26	0,24	0,18	0,13	0,10	0,07	0,07	0,04	0,06	0,05	0,04	0,04
remuneration and drivers business trips and social insurance, down to the employer	0,56	0,56	0,81	0,92	0,95	0,97	0,93	1,00	1,06	1,12	1,16	1,27
transport means insurance and tax on fixed assets	0,12	0,10	0,23	0,27	0,29	0,32	0,37	0,43	0,47	0,48	0,49	0,52
road tolls	0,08	0,15	0,34	0,41	0,41	0,41	0,36	0,47	0,40	0,40	0,43	0,43
other costs of the company's transport activity	0,22	0,20	0,26	0,28	0,27	0,25	0,31	0,22	0,27	0,29	0,31	0,26
Number of enterprises examined	20	42	23	41	57	57	59	58	65	69	61	84

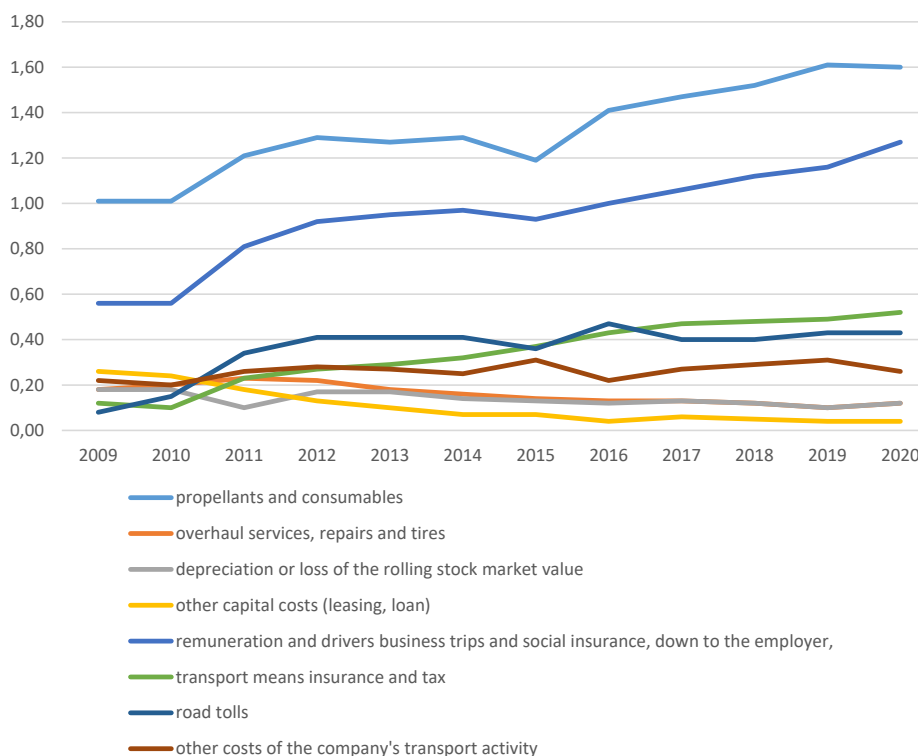
Source: calculations based on the ITS database on costs at the truck transport companies (as of 2021/12/01)

Fig. 6. Average weighted generic costs of 1 vehicle-kilometre of mileage at the surveyed international transport companies (universal rolling stock; over 12.0 Mg GVW; eastern markets; 2009 – 2020) [PLN/vehicle-km]



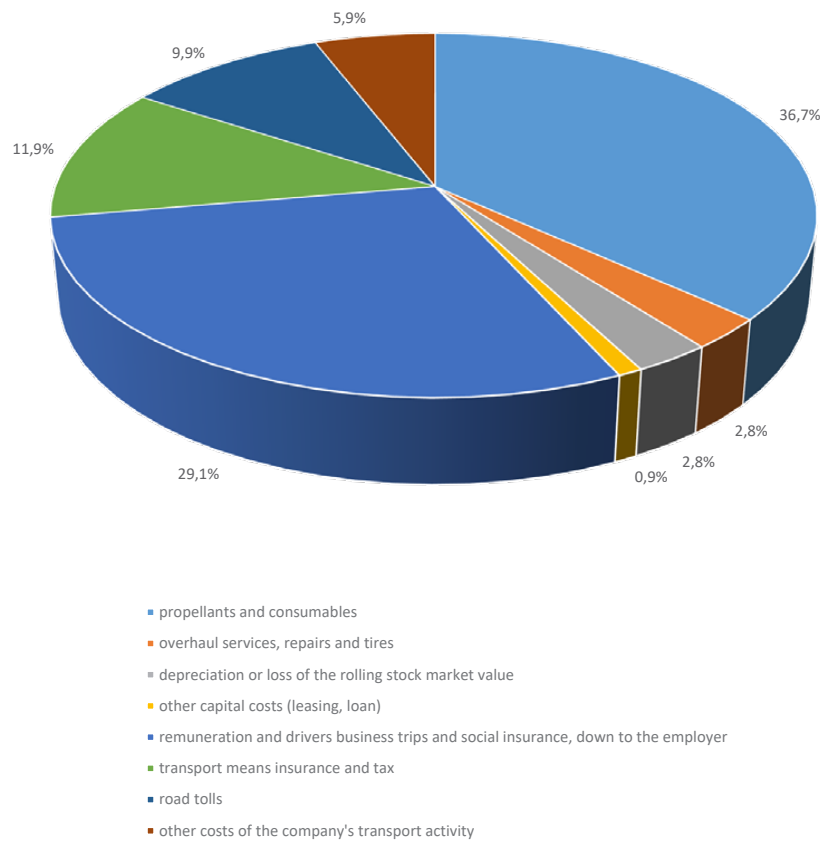
Source: own drawing based on data from Tab. 6

Fig. 7. Variability of the average weighted costs of 1 vehicle-kilometre of mileage by type of costs at the surveyed international transport companies in 2009 – 2020 (universal rolling stock; over 12.0 Mg GVW; eastern markets) [PLN/vehicle-km]



Source: own drawing based on data from Tab. 6

Fig. 8. Generic structure of the average weighted cost of 1 vehicle-kilometre of mileage at the surveyed enterprises licensed for international transport in 2020 (universal rolling stock over 12.0 Mg GVW; eastern markets) [%]



Source: own drawing based on data from Tab. 6

Tab. 7. Average costs of 1 vehicle-kilometre in total and by selected types of costs in 2009, 2018, 2019 and 2020 at the surveyed enterprises (universal rolling stock over 12.0 Mg GVW, markets of other EU countries and eastern markets)

	Markets of other EU countries		Eastern markets	
	PLN/vehicle-km	%	PLN/vehicle-km	%
Average costs of 1 vehicle-kilometre of mileage in 2020 including:	4,39	100	4,36	100
propellants and consumables	1,70	38,7	1,60	36,7
overhaul services, repairs and tires	0,12	2,7	0,12	2,8
depreciation or loss of the rolling stock market value	0,11	2,5	0,12	2,8
other capital costs (leasing, loan)	0,04	0,9	0,04	0,9
remuneration and drivers business trips and social insurance, down to the employer	1,26	28,7	1,27	29,1
transport means insurance and tax on fixed assets	0,52	11,9	0,52	11,9
road tolls	0,50	11,4	0,43	9,9
other costs of the company's transport activity.	0,14	3,2	0,26	5,9
Average costs of 1 vehicle-kilometre of mileage in 2019 including:	4,21	100	4,24	100
propellants and consumables	1,69	40,1	1,61	37,9
overhaul services, repairs and tires	0,11	2,6	0,1	2,4
depreciation or loss of the rolling stock market value	0,1	2,4	0,1	2,4
other capital costs (leasing, loan)	0,04	1	0,04	1
remuneration and drivers business trips and social insurance, down to the employer	1,12	26,6	1,16	27,3
transport means insurance and tax on fixed assets	0,5	11,9	0,49	11,6
road tolls	0,49	11,6	0,43	10,1
other costs of the company's transport activity.	0,16	3,8	0,31	7,3
Average costs of 1 vehicle-kilometre of mileage in 2018 including:	4,11	100	4,1	100
propellants and consumables	1,63	39,7	1,52	37,2
overhaul services, repairs and tires	0,12	3	0,12	2,9
depreciation or loss of the rolling stock market value	0,12	2,9	0,12	2,9
other capital costs (leasing, loan)	0,04	1,1	0,05	1,1
remuneration and drivers business trips and social insurance, down to the employer	1,09	26,4	1,12	27,4
transport means insurance and tax on fixed assets	0,48	11,6	0,48	11,7
tax on transport means				
road tolls	0,5	12,1	0,4	9,7
other costs of the company's transport activity.	0,13	3,2	0,29	7
Average costs of 1 vehicle-kilometre of mileage in 2009 including:	2,99	100	2,62	100
propellants and consumables	1,13	37,7	1,01	38,5
overhaul services, repairs and tires	0,18	6,1	0,18	6,7
depreciation or loss of the rolling stock market value	0,19	6,5	0,18	7
other capital costs (leasing, loan)	0,33	11,1	0,26	10,1
remuneration and drivers business trips and social insurance, down to the employer	0,56	18,6	0,56	21,5
transport means insurance and tax on fixed assets	0,11	3,6	0,11	4,3
tax on transport means				
road tolls	0,25	8,5	0,09	3,3
other costs of the company's transport activity.	0,23	7,8	0,22	8,5

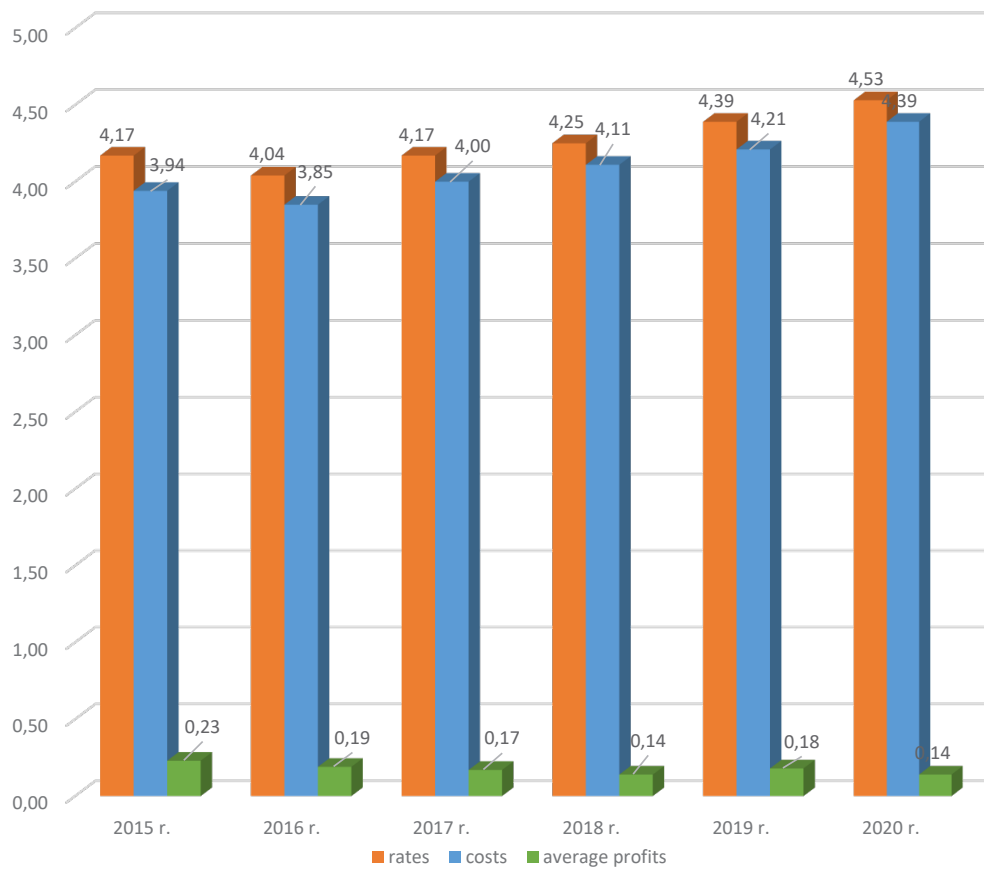
Source: calculations based on the ITS database on costs at the truck transport companies (as of 2021/12/01)

Tab. 8. Average weighted costs of 1 vehicle-kilometre of mileage and average weighted rates for 1 vehicle-kilometre of mileage at the surveyed companies in 2015-2020 (universal rolling stock, more than 12.0 Mg GVW) [PLN/vehicle-km]

markets	2015			2016			2017			2018			2019			2020		
	costs	rates	profit	costs	rates	profit	costs	rates	profit	costs	rates	profit	costs	rates	profit	costs	rates	profit
EU countries	3,94	4,17	0,23	3,85	4,04	0,19	4,00	4,17	0,17	4,11	4,25	0,14	4,21	4,39	0,18	4,39	4,53	0,14
eastern	3,49	3,90	0,41	3,83	4,14	0,31	3,99	4,17	0,18	4,10	4,26	0,16	4,24	4,41	0,17	4,36	4,55	0,19

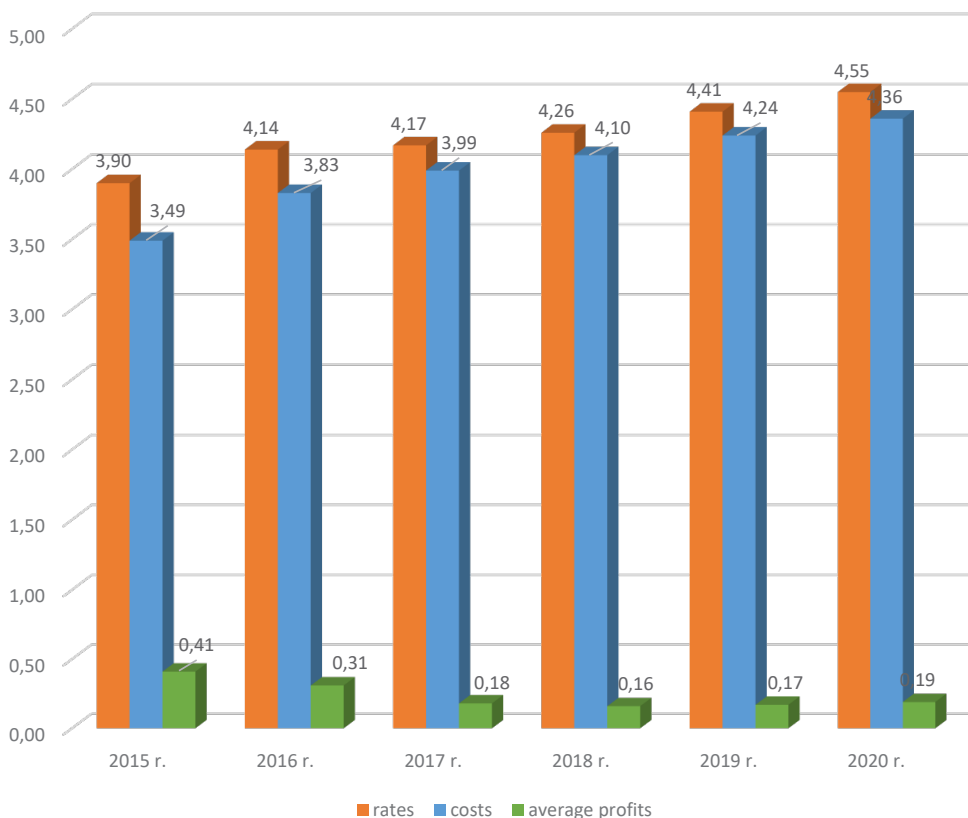
Source: calculations based on the ITS database on costs at the truck transport companies (as of 2021/12/01)

Fig. 9. Average weighted freight rates, costs and average unit profit of the surveyed international trucking companies operating mainly on the EU countries markets in the years 2015-2020 (universal rolling stock, over 12.0 Mg GVW) [PLN/vehicle-km]



Source: own drawing based on the data in Table 8

Fig. 10. Average weighted freight rates, costs and average unit profit of the surveyed international truck transport companies operating mainly on eastern markets in the years 2015-2020 (universal rolling stock, over 12.0 Mg GVW) [PLN/vehicle-km]



Source: own drawing based on data from Tab. 8

Tab. 9. Profit margins and their dynamics at the truck transport on eastern markets and EU countries, in the years 2015-2020 (universal rolling stock, over 12.0 Mg GVW) [PLN/vehicle-km]

Unit margin of transports PLN/vehicle-km	EU markets						Unit margin of transports PLN/vehicle-km	Eastern markets					
	2015	2016	2017	2018	2019	2020		2015	2016	2017	2018	2019	2020
unit profit.	0,23	0,19	0,17	0,14	0,18	0,14	unit profit	0,41	0,31	0,18	0,16	0,17	0,19
shipping rate	4,17	4,04	4,17	4,25	4,39	4,53	shipping rate	3,90	4,14	4,17	4,26	4,41	4,55
net profit margin in%	5,50	4,70	4,10	3,30	4,10	3,10	net profit margin in%	10,50	7,50	4,30	3,80	3,90	4,10

Source: own calculation based on Tab. 7

3. Conclusions from the studies of average unit costs at the international trucking companies for 2020 against the background of cost studies from the years 2009 – 2020

- 1) The average weighted costs of 1 vehicle-kilometre of mileage in 2020 at the surveyed companies of international truck transport, whose transport was dominated by serving EU markets, amounted to PLN 4.39/vehicle-km, and serving eastern markets – PLN 4.36/vehicle-km of mileage.
- 2) When compared to the average unit costs in 2019, the increase in average unit costs in 2020 amounted to approximately 4.2% on the EU countries markets and 2.8% on the eastern markets, and the dynamics

of their growth in the entire period 2009-2020 it was respectively: 146% and 166%.

- 3) The structure of the average weighted costs of 1 vehicle-kilometre was dominated by the costs of propellants and operating materials, as well as remuneration and business trips (36.7-38.7% and 28.7-29.1%, respectively). Insurance costs were another significant item in the structure, followed by the cost of road tolls (11.9% and 11.4%, respectively).
- 4) In 2020, as compared to 2009, the average weighted unit cost of road tolls more than doubled, and their dynamics was much higher for transport performed on the eastern markets (500%).
- 5) The average weighted unit cost of remuneration of drivers serving EU and eastern markets (including business trips) more than doubled

- (the dynamics index amounted to approx. 226%), and unit fuel costs increased by an average of 58% in relation to the operations on the eastern markets and by 50% in relation to the operation on the EU markets.
- 6) In comparison with the average unit costs in 2009, the average costs of 1 vehicle-kilometre of mileage in 2020 increased on the eastern markets by about 66%, and on the EU countries markets by about 46%.
 - 7) In the whole analysed period, the costs of road tolls grew fastest, followed by drivers' salaries (including business trips) and social security costs for the employer, as well as transport means insurance and tax costs.
 - 8) In the last 5 years, the average shipping rates at the surveyed enterprises grew faster on the markets of the EU countries (the dynamics index amounted to 112%) than on the eastern markets (the dynamics index amounted to 109%).
 - 9) In 2015-2018, we could observe an annual decrease in the average profit at the surveyed enterprises. This unfavourable trend was stopped in 2019. However, in 2020 the markets of the EU countries returned to the downward trend, while the unit profit increased in the eastern markets.
 - 10) The immediate prospects of recovering from the COVID-19 pandemic and, to a greater extent, the ongoing war in Ukraine, is likely to cause further deterioration in profitability indexes in this sector. However, it is already known that the current situation has not caused homogeneous changes among all companies providing international transport. There was a large variation in the dynamics of transport in terms of the goods handled and market segments (customers). Extending the research in this area would therefore be valuable in terms of strategic planning for Polish carriers operating on international markets.

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Attachment 1. Wzór ankiety dla przewoźników międzynarodowych



ANKIETA KOSZTY PRZEWOZÓW ŁADUNKÓW TRANSPORTEM SAMOCHODOWYM

Ankieta jest anonimowa. Dane w niej zawarte służą do badań prowadzonych w Instytucie Transportu Samochodowego we współpracy z ZMPD. Odpowiedzi na ewentualne zapytania dotyczące wypełnienia ankiety: tel. 22 536 10 79 (ZMPD), 22 438 52 87 lub 84 (ITS).

W celu prawidłowego wypełnienia ankiety prosimy:

Zaznaczyć odpowiedzi znakiem w kwadratach lub wpisać liczbę w miejscach wykropkowanych

Rok: | II Półrocze 2020 : |

1. Charakterystyka przedsiębiorstwa

1.1. Zakres działalności przedsiębiorstwa

Rodzaj licencji: krajowy przewóz rzeczy międzynarodowy przewóz rzeczy

Inna dodatkowa działalność: tak nie

1.2. Lokalizacja przedsiębiorstwa: województwo

1.3. Forma przedsiębiorstwa: spółka handlowa osoba fizyczna spółka cywilna

1.4. Kapitał: krajowy zagraniczny mieszany

	pow. 12 t dmc
1.5. Liczba eksploatowanych samochodów ciężarowych

1.6. Liczba pracowników ogółem, w tym kierowców

1.7. Dominujący rodzaj nadwozi taboru: uniwersalne chłodnicze samowyladowcze

cysterny pozostałe

1.8. Dominujący rynek w przewozach międzynarodowych: UE wschodni inny

2. Charakterystyka kosztów przewozów ładunków transportem samochodowym

Sposób podania kosztu: wartość za okres półrocza (zł) lub struktura (%)

Koszty wg wybranych rodzajów:	pow. 12 t dmc
2.1. materiały pędne i eksploatacyjne
2.2. usługi remontowe, naprawy i ogumienie
2.3. amortyzacja
2.4. pozostałe koszty kapitału (leasing, kredyt)
2.5. wynagrodzenia i delegacje kierowców oraz ubezp. społ. obciążaj. pracodawcę
2.6. ubezpieczenie środków transportu oraz podatek od środków transportu
2.7. opłaty drogowe
2.8. pozostałe koszty działalności przewozowej przedsiębiorstwa
Razem koszty:

3. Przebieg wszystkich samochodów ciężarowych w półroczu (km)
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4. Szacunkowy średni koszt 1wozokm przebiegu (zł/km)
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5. Średnia stawka przewozowa (zł/km)
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Czy wprowadzone przepisy ograniczające międzynarodowe przewozy towarowe w związku z COVID-19 spowodowały spadek/wzrost obrotów Państwa firmy w okresie (proszę o podanie w ujęciu %):

lipiec - grudzień (II poł 2020 r.)

TAK.....

NIE.....