

ANALYSIS OF UNIT COSTS AT THE POLISH INTERNATIONAL TRUCK FREIGHT TRANSPORT COMPANIES IN 2019 - EASTERN MARKETS

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Summary

The article represents next part of the periodical publications of the Department of Economic Research in the field of cost analysis of the Polish international freight transport companies. It summarises and makes comparative assessments of the average unit costs of these companies for the 2019 in relation to the results of the previous period. The survey involved carriers operating on the eastern markets. The article presents the statistical characteristics of the entities surveyed, taking into account their size, determined based on the number of the fleet's heavy goods vehicles operated. It also shows how, the average costs of one vehicle-kilometre (veh-km) of mileage for a truck above 12.0 Mg GVW, are shaped, according to the size of the companies and taking into account the destinations of transport. The generic costs structure of the companies examined, has also been analysed. Presented in the tabular and graphic form is the evolution of unit costs for both 2019 and the whole 2009-2019 period.

Key words

international transport, freight transport, unit costs

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1. Introduction

Performing transport work on the eastern markets and in the EU is characterized by different specificity, resulting both from the applicable law and often from working conditions. The effect of the existing differences are different values of the unit costs of enterprises and a different type structure of the aforementioned costs. The paper presents the results of analyses regarding the estimation of the average cost of 1 vehicle-kilometre of mileage in 2018 and the type structure at the surveyed enterprises, where the international freight transport is performed to the markets of countries outside Poland's Eastern border. The work is a continuation of many years of analyses in the field of international transport costs, being periodically prepared at the Department of Economic Research (ZBE) of the Motor Transport Institute.

2. Characteristics of the sample and the research method

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

- direct surveys (survey template - Annex II) at the selected companies providing international truck transport services,
- research via the electronic form of the ITS survey.

The Association of International Road Carriers (ZMPD), with which ZBE has been cooperating in this area for many years, had a key share in collecting data from international freight transport companies. The data obtained was subject to a stage validation and verification. Then it was loaded into an electronic database, based on the proprietary computer program.

Table 1. Characteristic features of the studied sample of international freight transport companies in the first half of 2019

Description	Measurement unit	Micro (up to 5 cars)	Small (6 to 9 cars)	Medium (10 to 49 cars)	Large (50 and more cars)	On average
Average number of trucks	item	2.8	7.6	21.4	89.5	29.5
Average number of employees in the enterprise	employee	4.0	10.5	29.9	125.7	41.4
Average number of drivers in the enterprise	driver	2.8	8.1	21.5	91.7	30,1
Average mileage of cars in the enterprise	thousands of km	192.7	494.6	1824.3	5169.4	1929.6
Average mileage of one car in the enterprise	thousands of km	69.4	64.9	85.4	57.8	65.4
<i>Number of enterprises examined</i>		9	8	11	6	34

Source: Authors' own compilation based on the ITS database on costs at the freight transport companies (as of 2020.05.01).

Table 2. Characteristic features of the studied sample of international truck transport companies in the second half of 2019

Description	Measurement unit	Micro (up to 5 cars)	Small (6 to 9 cars)	Medium (10 to 49 cars)	Large (50 and more cars)	On average
Average number of trucks	item	2.9	6.7	16.7	73.7	25
Average number of employees in the enterprise	employee	4.0	10	25.5	88.7	32
Average number of drivers in the enterprise	driver	3.0	6.7	16.8	74	25.1
Average mileage of cars in the enterprise	thousands of km	189.8	376.7	1023.6	4167.9	1439.5
Average mileage of one car in the enterprise	thousands of km	65.4	56.2	61.3	56.6	59.9
<i>Number of enterprises examined</i>		7	3	15	4	29

Source: Authors' own compilation based on the ITS database on costs at the freight transport companies (as of 2020.05.01).

Ultimately, 34 surveys regarding the first half of 2019 and 29 surveys regarding the second half of 2019 were included in the analysis. A total of 63 surveys regarding transport activity for 2019 were analysed. The results of the presented cost research allowed to capture the trends of changes in the unit costs of transport. The detailed characteristics of the analysed research sample are presented in Tables 1-3.

The analysis covered enterprises in which transport is carried out with the use of vehicles with universal bodies of a GVW above 12.0 Mg. Tables 1 and 2 summarize information on the surveyed group of enterprises, broken into two halves of 2019.

Table 3 presents the characteristics of the studied sample of international freight transport companies for 2019.

It shows that the studied sample included the largest number of medium-sized enterprises, both as part of the analysis of data from the first and second half of 2019. Besides, the differences in the size of enterprises serving eastern markets deepened in the second half of 2019. In this group, there was an increase in medium-sized entities at the expense of other types of enterprises.

In the surveyed sample of enterprises with a dominant share of transport to and from eastern markets, the statistical enterprise in 2019 had an average number of 27.3 vehicles with a GVW exceeding 12.0 Mg and universal body (Table 3). In 2019, the average annual mileage of a truck used by companies whose vehicles travelled mainly on the roads of Eastern countries was around 62.7 thousand km. On average, in 2019, the surveyed enterprise from this group employed about 37 employees, including slightly over 27.6 drivers (Table 3).

Table 3. Characteristic features of the studied sample of international freight transport companies in 2019 with a dominant share of transport to and from eastern markets,

Description	Measurement unit	Micro (up to 5 cars)	Small (6 to 9 cars)	Medium (10 to 49 cars)	Large (50 and more cars)	On average
Average number of trucks	item	2.9	6.7	16.7	73.7	25
Average number of employees in the enterprise	employee	4.0	10	25.5	88.7	32
Average number of drivers in the enterprise	driver	3.0	6.7	16.8	74	25.1
Average mileage of cars in the enterprise	thousands of km	189.8	376.7	1023.6	4167.9	1439.5
Average mileage of one car in the enterprise	thousands of km	65.4	56.2	61.3	56.6	59.9
<i>Number of enterprises examined</i>		7	3	15	4	29

Source: Authors' own compilation based on the ITS database on costs at the freight transport companies (as of 2020.05.01).

3. Conclusions from the research

As shown by the data presented, the international road freight transport sector was relatively healthy in 2019 on the eastern markets. In the last three years, the average annual increase in the unit cost of 1 vehicle-kilometre in the studied sample of enterprises was at a similar level (approx. 2-3%), although in the entire analysed period of 2009-2019 the cost dynamics indicator was as high as 140%. High variability in the 2015-2019 years period was shown in the profit margins for the transports provided on eastern markets.

Further part of the article describes the differences in cost variations resulting from: the supported transport route, the size of the enterprise, and the type of cost. The average annual profit amounted to less than PLN 0.2/veh-km, although with a regular ward trend, resulting from the tightening of regulations on international freight transport, which are pioneering solutions in relation to the provisions of the, so-called, Mobility Package. However, it is worth noting the increase in profit margins in the last year of the study (the profit in the entire group of surveyed companies increased from PLN 0.14/veh-km in 2018 to PLN 0.18/veh-km in 2019).

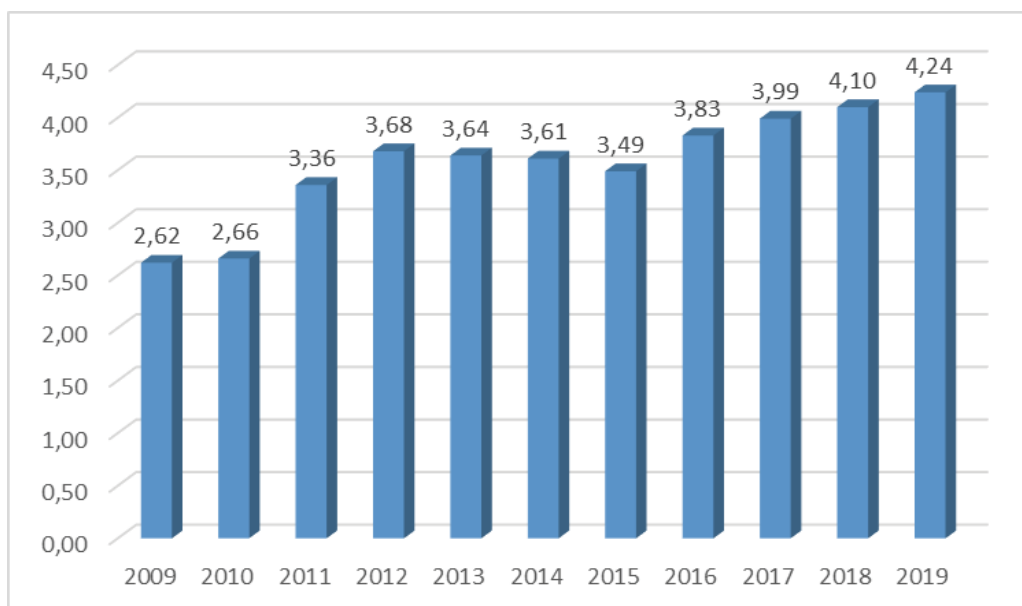
This, however means that the profitability of transport is still much lower than that achieved in 2009-2015. One should not forget about the impact of the Russian embargo on the decline in profit margins after 2014 in the entire group of companies studied. In 2014, the Russian government introduced a ban on the importation of a significant part of agricultural products from the EU to the Russian Federation, including fruit and vegetables. This particularly affected Polish carriers that perform the majority of international transport in this market segment. Then, in June 2015, the Russian authorities decided to continue the embargo, and in subsequent years they extended it by changing only the scope and list of export items. These decisions hit the largest Polish exporters and carriers the hardest. Already in the period from January to October 2014, export of Polish meat and meat products decreased by 73.6%, and fruit - by 34.5%, and vegetables - by 31%. This resulted in changes in the transit directions and new models of cooperation between EU producers and Polish carriers. Due to the introduced restrictions, new transport routes for quasi-exports from the EU countries appeared, which often resulted in an extension of the average annual mileage and worsened the profitability ratios on the Eastern markets. Later, the situation systematically stabilized.

4. Analyses' results

The tables 4-7 present the results of cost studies at the freight transport companies by size groups of enterprises and calculated as the weighted average costs of 1 vehicle-kilometre in the first and second half of 2019

and for the entire 2019, for the entire sample of international transport companies with a dominant share of transport to and from eastern markets. The weighted average costs of 1 vehicle-kilometre in the group in question in 2019 amounted to PLN 4.24/vehicle-km. The results of the research conducted in the previous years are shown in Fig. 1:

Fig. 1. Average costs of 1 vehicle-kilometre of mileage at the surveyed international transport companies in the years 2009 - 2019 (universal rolling stock over 12.0 Mg GVW; eastern markets) [PLN/veh-km]



Source: authors' own drawing based on ITS cost database

Table 4. Average costs of 1 vehicle-kilometre of mileage in total and by type of costs, size of enterprises and weighted average costs at the surveyed enterprises in the first half of 2019 (universal rolling stock; eastern markets) [PLN/veh-km]

Description	Micro (1-to 5) [PLN/veh- km]	Small (6 - 9) [PLN/ veh-km]	Medium (10 - 49) [P LN/ veh-km]	Large (50+) [P LN/ veh-km]	Average weighted costs of 1 vehicle-kilometre of mileage (PLN/veh- km)
The average cost of 1 vehicle-kilometre of mileage, including:	4.21	4.24	4.24	4.35	4.26
Propellants and consumables	1.61	1.6	1.61	1.61	1.61
Overhauls, repairs and tires	0.12	0.09	0.12	0.12	0.12
Depreciation or loss of market value of the rolling stock	0.1	0.1	0.1	0.1	0.1
Remaining capital costs (leasing, credit)	0.03	0.03	0.03	0.03	0.03
Remuneration and business trips of drivers as well as social insurance incurred by the employer	1.18	1.14	1.18	1.18	1.18
Insurance of transport means and taxes on transport means	0.49	0.45	0.49	0.49	0.49
Road tolls	0.42	0.4	0.42	0.42	0.42
Other costs of the companies' transport activity	0.29	0.44	0.29	0.29	0.29
<i>Number of enterprises examined</i>	9	8	9	9	9

Source: calculations based on the ITS database on costs in truck at the freight transport companies (as of 2020.05.01)

Table 5. Average costs of 1 vehicle-kilometre of mileage in total and by type of costs, size of enterprises and weighted average costs at the surveyed enterprises in the second half of 2019 (universal rolling stock; eastern markets) [PLN/veh-km]

Description	Micro (1-to 5) [PLN/veh- km]	Small (6 - 9) [PLN/veh- km]	Medium (10 - 49) [PLN/veh- km]	Large (50+) [PLN/veh- km]	Average weighted costs of 1 vehicle-kilometre of mileage (PLN/veh- km)
The average cost of 1 vehicle-kilometre of mileage, including:	4.33	4.1	4.16	4.18	4.19
Propellants and consumables	1.16	1.56	1.58	1.54	1.46
Overhauls, repairs and tires	0.076	0.15	0.1	0.14	0.11
Depreciation or loss of market value of the rolling stock	0.093	0.1	0.11	0.14	0.11
Remaining capital costs (leasing, credit)	0.01	0.01	0.05	0.06	0.03
Remuneration and business trips of drivers as well as social insurance incurred by the employer	1.28	1.15	1.14	1.08	1.16
Insurance of transport means and taxes on transport means	0.51	0.49	0.53	0.51	0.51
Road tolls	0.41	0.47	0.43	0.46	0.44
Other costs of the companies' transport activity	0.35	0.17	0.22	0.26	0.25

Source: calculations based on the ITS database on costs at the truck freight transport companies (as of 2020.05.01)

Table 6. Average costs of 1 vehicle-kilometre of mileage in total and by type of costs, size of enterprises and weighted average costs at the surveyed enterprises in 2019 (universal rolling stock; eastern markets) [PLN/veh-km]

Description	Micro (1 - 5) [PLN/veh- km]	Small (6 - 9) PLN/veh- km]	Medium (10 - 49) [PLN/veh- km]	Large (50+) [PLN/veh- km]	Average weighted costs of 1 vehicle-kilometre of mileage (PLN/veh-km)
The average cost of 1 vehicle-kilometre of mileage, including:	4.27	4.2	4.19	4.28	4.24
Propellants and consumables	1.605	1.588	1.606	1.629	1.61
Overhauls, repairs and tires	0.098	0.102	0.097	0.108	0.1
Depreciation or loss of market value of the rolling stock	0.102	0.097	0.099	0.102	0.1
Remaining capital costs (leasing, credit)	0.013	0.025	0.045	0.063	0.04
Remuneration and business trips of drivers as well as social insurance incurred by the employer	1.223	1.144	1.147	1.128	1.16
Insurance of transport means and taxes on transport means	0.487	0.462	0.513	0.504	0.49
Road tolls	0.41	0.417	0.429	0.448	0.43
Other costs of the companies' transport activity	0.327	0.367	0.256	0.301	0.31
<i>Number of enterprises examined</i>	16	11	24	10	61

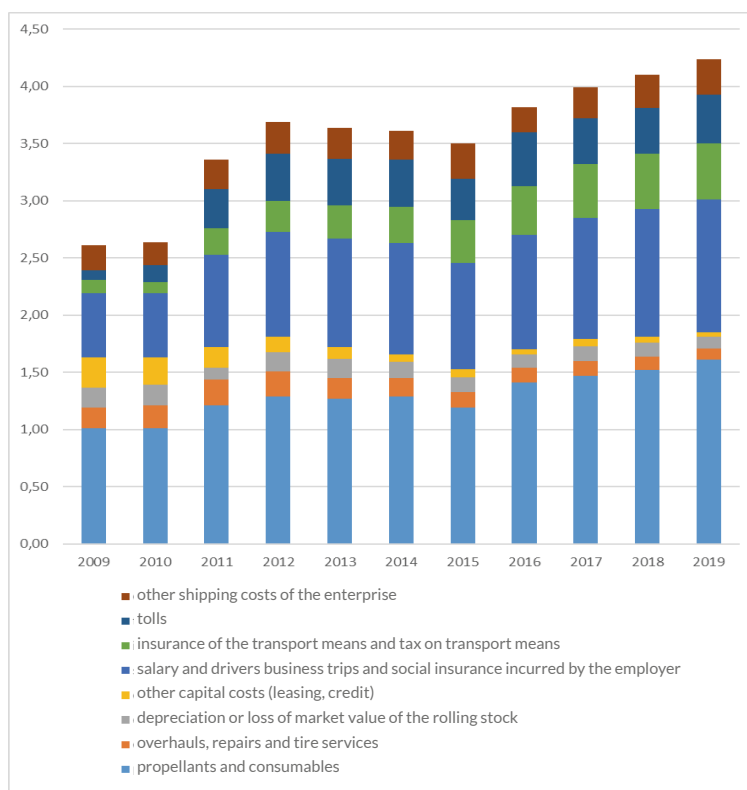
Source: calculations based on the ITS database on costs at the truck freight transport companies (as of 2020.05.01)

Table 7. Average weighted costs of 1 vehicle-kilometre of the mileage in total and by selected types of costs in the years 2009-2019 at the surveyed truck freight transport companies operating rolling stock over 12.0 Mg GVW with universal bodies, licensed for international transport, with a dominant share of transport to and from eastern markets

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
The average cost 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
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
Overhauls, 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
Depreciation or loss of market value of the rolling stock	0.18	0.18	0.10	0.17	0.17	0.14	0.13	0.12	0.13	0.12	0.10
Remaining capital costs (leasing, credit)	0.26	0.24	0.18	0.13	0.10	0.07	0.07	0.04	0.06	0.05	0.04
Remuneration and business trips of drivers as well as social insurance incurred by the employer	0.56	0.56	0.81	0.92	0.95	0.97	0.93	1.00	1.06	1.12	1.16
Insurance of transport means and taxes on transport means	0.12	0.10	0.23	0.27	0.29	0.32	0.37	0.43	0.47	0.48	0.49
Road tolls	0.08	0.15	0.34	0.41	0.41	0.41	0.36	0.47	0.40	0.40	0.43
Other costs of the companies' transport activity	0.22	0.22	0.26	0.28	0.27	0.25	0.31	0.27	0.27	0.29	0.31
<i>Number of enterprises examined</i>	20	42	23	41	57	57	59	58	65	69	61

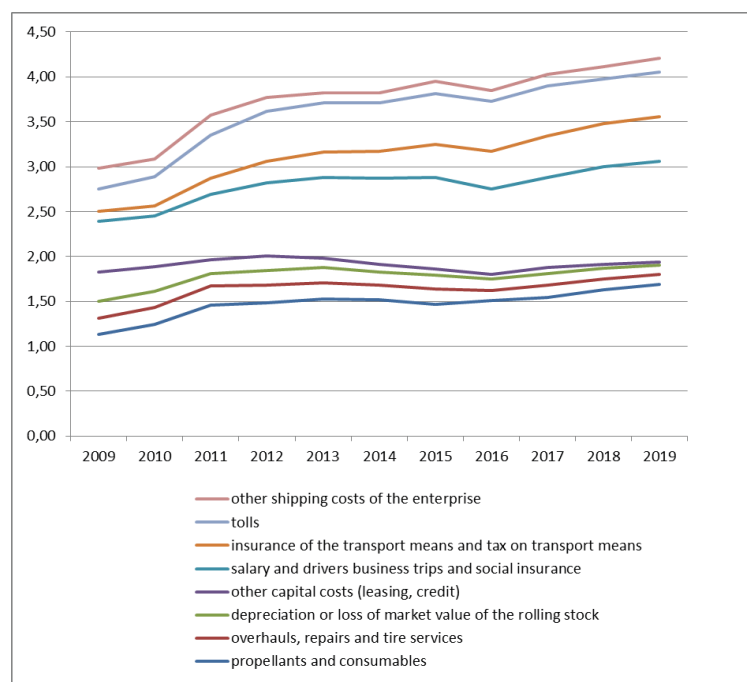
Source: calculations based on the ITS database on costs at the truck freight transport companies (as of 2020.05.01)

Fig. 2. Average weighted generic costs of 1 vehicle-kilometre of mileage at the surveyed companies of international transport (universal rolling stock; over 12.0 Mg GVW; eastern markets; 2009 - 2019) [PLN/veh-km]



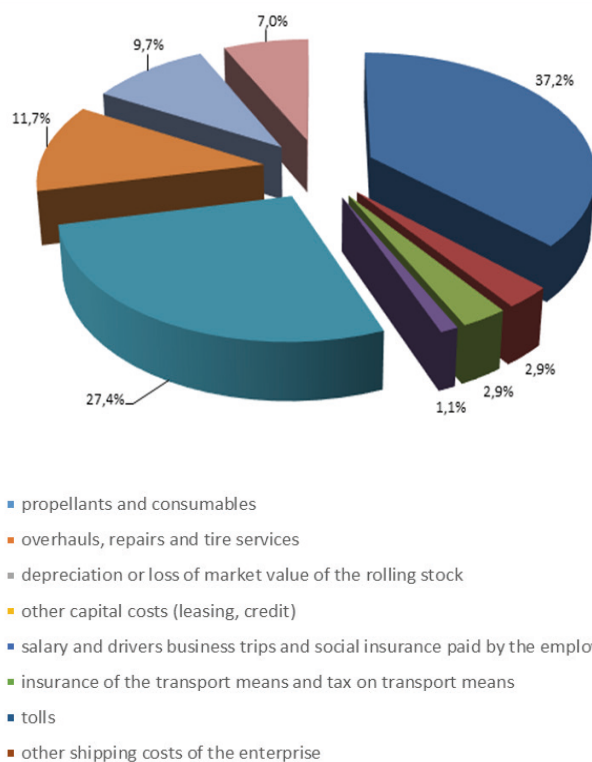
Source: calculations based on the ITS database on costs at the truck freight transport companies (as of 2020.05.01)

Fig. 3. Variability of weighted average costs of 1 vehicle-kilometre of mileage by the type of costs at the surveyed international transport companies in the years 2009 - 2019 (universal rolling stock; over 12.0 Mg GVW; eastern markets) [PLN/veh-km]



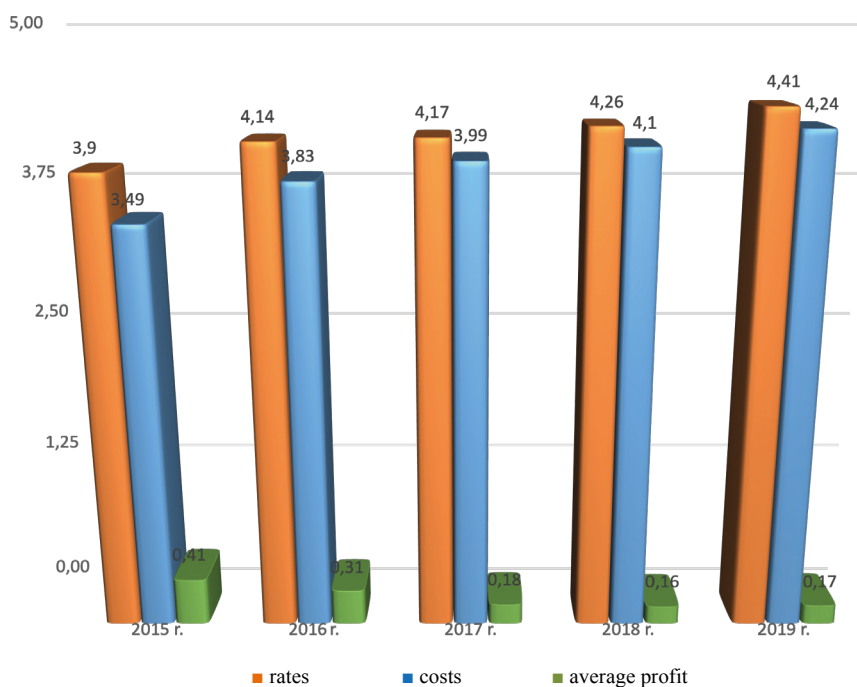
Source: calculations based on the ITS database on costs in truck at the freight transport companies (as of 2020.05.01)

Fig.4. Generic structure of the average weighted cost of 1 vehicle-kilometre of mileage at the surveyed companies licensed to provide international transport in 2019 (universal rolling stock over 12.0 Mg GVW; eastern markets) [%]



Source: calculations based on the ITS database on costs at the truck freight transport companies (as of 2020.05.01)

Fig. 5. Average weighted freight rates, costs and average unit profit of the surveyed international truck freight transport companies operating mainly on the eastern markets in 2015-2019 (universal rolling stock, over 12.0 Mg GVW) [PLN/ veh-km]



Source: Authors' own compilation based on the ITS database on costs at the freight transport companies (as of 2020.05.01)

5. Conclusions

Conclusions from the studies of the average unit costs at the international truck transport companies for 2019 against the background of cost studies from the years 2009 – 2018.

1. The weighted average costs of 1 vehicle-kilometre of mileage in 2018 and in 2019 at the surveyed companies of international truck freight transport, in which transport was dominated the routes to and from eastern markets, amounted to **PLN 4.10/veh-km and PLN 4.24/veh-km** of mileage respectively.
 2. Compared to the average unit costs in 2009, the average costs of 1 vehicle-kilometre in 2018 increased by approximately 56%, and in 2019 by approximately 62%.
 3. In 2019, compared to 2009, the average unit cost of the road tolls increased more than fourfold (by 377%), the unit cost of remuneration of drivers (including business trips) and social insurance costs, incurred by the employer, more than doubled (by 107%), while the unit costs of transport means insurance and costs of taxes on transport means increased more than fourfold, and unit costs of fuel increased by more than half (by about 59%).
 4. In 2018 and in 2019, the transport rates at the surveyed enterprises operating mainly on the eastern markets were on average at the level of **PLN 4.26/veh-km and PLN 4.41/veh-km** of mileage, respectively.
 5. In 2015-2018, at the surveyed companies of international truck freight transport, whose haulage was dominated by the routes to and from eastern markets, we could observe an annual decrease in the average profit. This unfavourable trend was halted in 2019. The weighted average costs of 1 vehicle-kilometre of mileage of the enterprises operating mainly on the eastern markets have been steadily increasing since 2016, on average by PLN 0.10-0.15 a year. The freight rates of these companies are also growing, but at a slower pace.
 6. In the analysed period, on the eastern markets, the highest increase in the share of weighted average costs in the category of remuneration, business trips and social security for the employer covered by the employer can be observed. Over the past eleven years, the value has changed from 0.56 in 2009 to 1.16 for 2019.
- The second category of costs for which a systematic increase has been noticed are in the share of weighted average costs are the costs incurred for propellants and consumables. For the eastern markets, an increase in the value of costs was recorded, from the level of 1.01 in 2009 to the value of 1.61 in 2019.

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