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WAGE INEQUALITY ACROSS THE ROAD TRANSPORT SECTOR WITHIN THE EU

Summary. The question of how to regulate the salaries of drivers working in the international road transport sector to balance the promotion of free movement of persons and the integration of the market with adequate protection of workers' rights is rather complex. The range of problems of those seeking to ensure fair competition and fair treatment of employees arises from the fact that drivers operate across Europe but come from different countries where wage standards are significantly different, along with the working conditions. The paper addresses the issue of insufficient harmonization of social conditions in relation to the remuneration of drivers involved in road transport. The purpose of this paper is to investigate whether there are differences in driver remuneration across the EU, even though they carry out the same transport within one EU territory as part of international road haulage. It also aims to identify whether there is a change in the terms and conditions of wage compensation over time.

1. INTRODUCTION

Carriers in Western Europe in 2004 pointed out the risk of harmonizing the road freight market without harmonizing social and tax conditions. The emergence of the opportunity to employ a driver from Central and Eastern Europe has caused a distortion of the competitive environment in the road freight sector. The significance of the distortion of the competitive environment has gained significance at a time when manufacturing companies started using the just-in-time method, significantly reducing their inventory and storage costs [1, 4]. This, of course, has increased the use of freight transport between companies, and the number of supplies between companies has increased. The use of lorries has begun to increase, and haulers have begun to place greater emphasis on the quality of service, speed and reliability. New market conditions have led to an increased share of night work in the driver's weekly working hours, which has also changed the driver's willingness to perform the profession of driver under specific wage conditions [2]. Changing conditions in the road freight transport market has resulted in increased demand for road freight drivers. Several companies from Western Europe are getting drivers from the Central and Eastern parts of the EU. Leaving drivers from the eastern and central parts of the EU is causing a problem in this part of the EU. The reasons for the departure of the drivers mainly lie in the differences in driver compensation in individual EU countries [3, 6]. The aim of this contribution is to investigate whether there are indeed differences in driver remuneration across the EU, even though they carry out the same transport within one EU territory as part of international road freight transport.

2. EMPLOYMENT OF DRIVERS FROM CENTRAL AND EASTERN EUROPE

Employment of drivers from Eastern and Central Europe caused the most illegal workers in the European Union to be surveyed in the construction and road transport sector in 2000. The wage of these employees is often lower than the average wage level in the country. The European Commission's 2004 enlargement targets for the EU were the requirement for candidate countries to catch up with western European countries in terms of wages and social legislation, integration into the European Union and compliance with EU requirements and EU regulations [5, 8]. In the field of road transport, wage harmonization is specific, as carriers offer transport throughout the European Union market to which each haulier established in the European Union, with a community license, has equal access [9].

Working migration is one of the top topics in the EU Legislative Body regarding the proposed package of measures that clarifies the salaries and conditions of EU staff members posted to jobs outside their home country, known as the Posting of Workers Directive. Initially road drivers were excluded from this directive. However, in recent years, there has been an increase in the number of transport companies that have moved jobs from richer EU countries to Central and Eastern Europe, with the aim of bypassing wage demands in their countries. This has prompted national legislation and protectionist measures in countries such as France, Germany and Austria, and has witnessed an increase in court cases related to driver wages across the EU [7, 12]. Under SR conditions, wages are above the wage in the national economy. For this reason, the aim of this research is to conclude whether there is a persistent gap in driver wages in the EU.

3. OWN RESEARCH OF THE COMPARISON OF AVERAGE WAGES OF DRIVERS IN THE EU

To verify the assumption of the pay gap between drivers of road freight within the EU Member States, research has been carried out on the level of remuneration in two consecutive periods – spring 2017 and autumn 2018. The aim of the two surveys is that we want to identify not only the level of wages of drivers in individual countries EU but also to find a change that makes it possible to predict whether the remuneration of drivers employed in the SR is the average of drivers' wages in the Western European Union, and that the number of drivers leaving for work abroad will be reduced.

3.1. Research on the average wage of drivers in 2017

In the first half of 2017, in relation to driver remuneration, a survey of drivers' wages was conducted in selected transport companies based in 10 different EU countries. Based on the survey conducted, the data on average wages used for conformity testing are compared, which compares whether driver wages differ between selected countries and at what significance level. The questionnaire regarding the remuneration of the drivers was conducted in the form of an anonymous electronic survey for its relative ease of filling and the availability in terms of distance. The electronic questionnaire was completed by 309 respondents, whereas social data were also used to collect data. The survey was attended by drivers of different age categories; the median age of drivers was 33 years, with most respondents being drivers who had at least 10 years of experience. As far as the category of vehicle on which the drivers (respondents) was concerned, the truck was predominant. Regarding the mode of transport in terms of territorial division, the bulk of respondents were engaged in international transport.

The conformity test is applied to the comparability of wage drivers in the Slovak Republic with respect to several selected EU Member States (Belgium, Denmark, Luxembourg, the Netherland, the Czech Republic, Norway, Poland, Austria and Italy).

In Slovakia, in the sample size range n = 116, we have found the following average wages of drivers in €:1380; 1500; 1050; 1170; 1250; 1350; 1400; 900; 550; 600; 1600; 2400; 1200; 1500; 1200;

1600; 1800; 850; 1700; 1800; 2000; 1200; 1200; 1700; 1200; 1550; 1300; 1650; 1500; 1400; 1500; 1500; 800; 850; 900; 1200; 1200; 750; 1200;1600; 1100; 1000; 1350; 1400; 600; 1400; 550; 1500; 1200; 600; 1200; 1600;1200; 1000; 700; 1000; 1600; 2000; 1500; 500; 1000; 1450; 1500; 600; 650; 1400; 750; 450; 2500; 1200; 2000; 1400; 600; 800; 1400; 550; 2500; 1100; 650; 1100; 1300; 900; 700; 800; 1300; 1500; 1000; 530; 2300; 1000; 1400; 1500; 2200; 1400; 750; 1600; 1200; 2100; 1100; 1600; 1200; 1500; 1300; 1750; 2000; 540; 404; 1400; 900; 1810; 1500; 1200; 500; 1300; 1400; 1500.

In selected EU countries, in the sample size range n = 60, we have found the following average wages of drivers in €: 500; 1750; 2450; 1500; 630; 2200; 2160; 1650; 1600; 900; 1500; 1750; 2500; 2500; 2100; 2180; 3690; 2500; 1850; 2300; 2100; 4301; 1400; 1600; 1600; 1700; 1750; 600; 2200; 1356; 573; 1600; 1146; 620; 1612; 1774; 2063; 1070; 1375; 554; 1135; 688; 1146; 1176; 722; 1031; 1713; 1135; 879; 1146; 825; 840; 722; 928; 1031; 877; 2475; 722; 933; 1719.
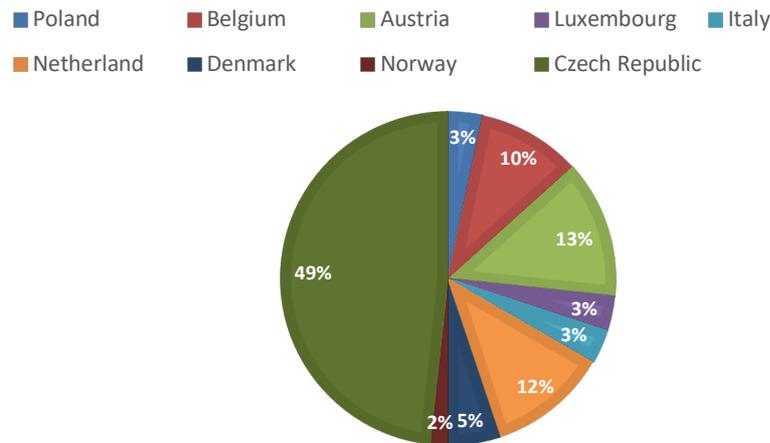

Fig. 1. The proportion of country representation in the survey

In relation to the given test, it is necessary to establish a null and alternative hypothesis:
- null hypothesis: Driver wages are not different in the SR and selected member countries at the level of significance α = 0.05.
- alternative hypothesis: Driver wages differ in the level of significance α = 0.05 in the Slovak Republic and selected member countries.

At the level of significance α = 0.05, we verify the assumption that the variability of average wage rates in Slovakia is the same as the variation of average wages of drivers in selected EU countries. We verify the hypothesis $H_0: \sigma_1^2 = \sigma_2^2$ versus a bilateral alternative $H_1: \sigma_1^2 \neq \sigma_2^2$:
σ_1^2 = variance of Slovak driver salaries, σ_2^2 = variance of driver salaries in other countries.
From the selection data, we calculate the selection characteristics:

$\bar{x}_1 = 1258.5690$ $\tilde{s}_1^2 = 211950.1649$ $\widetilde{s}_1 = 460.3805$

$\bar{x}_2 = 1517.4500$ $\tilde{s}_2^2 = 564202.3873$ $\widetilde{s}_2 = 751.1340$

$$F = \frac{\tilde{s}_1^2}{\tilde{s}_2^2} = \frac{211950.1649}{564202.3873} = 0.3757 \ . \tag{1}$$

Then, the critical values of the F-division are determined with $v_1 = n_1 - 1 = 115$ a $v_2 = n_2 - 1 = 59$ and degrees of freedom for α = 0.05:

$$F_{\frac{\alpha}{2}} = F_{0.025} = 0.65, F_{1-\frac{\alpha}{2}} = F_{0.975} = 1.59. \tag{2}$$

The test criterion value belongs to the critical area $v_\alpha = \left(0, F_{\frac{\alpha}{2}}\right)$; therefore, at the significance level α = 0.05, we reject the null hypothesis $H_0: \sigma_1^2 = \sigma_2^2$s, which means that the wage variation of drivers in Slovakia and the wages of drivers in selected member countries varies considerably at the significance level α = 0.05. In the case of different variance verification, the classical t-test cannot be

used, but the test for non-conformance variance, referred to as Welchow t-test, is used [10] [11]. The test will be performed using an analytical tool – a two-choice t-test with different variances in Excel.
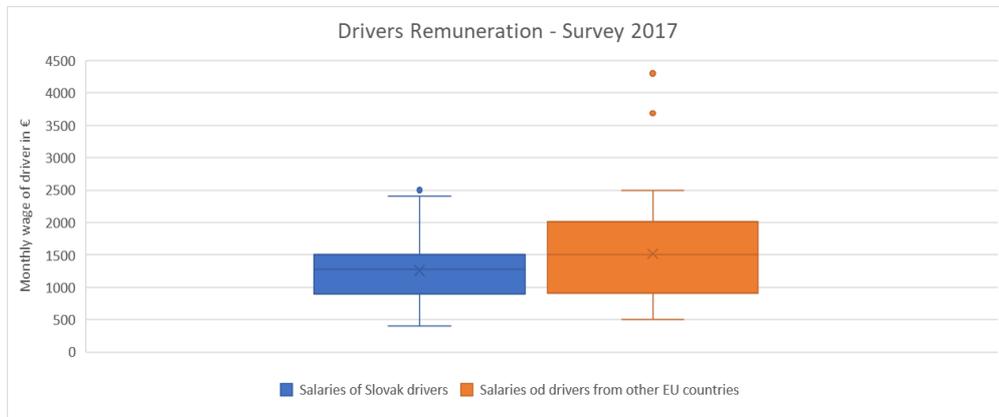

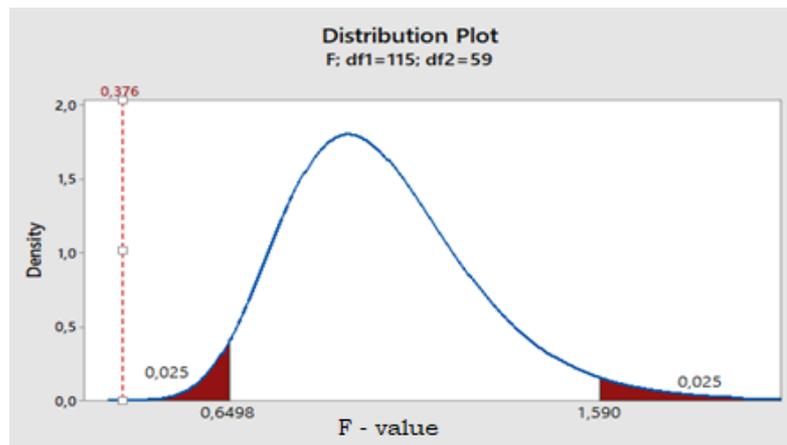Fig. 2. Graphic representation and comparison of the drivers' remuneration survey in 2017

Fig. 3. Chart of Critical Values and F-Partition Test Criterion (2017)

Given the two-way formulation of the alternative hypothesis, we are interested in the level of statistical significance achieved for the two-tailed P (2) test = 0.0167. Obviously, the achieved significance value is significantly less than the set level of 0.05, and it is therefore justified to reject the null hypothesis.

For graphical representation, then in Excel using the TINV function, we find the quantities. In this case, the number of degrees of freedom 83 (calculation using the analytical tool – Excel) and thus the quantities are determined by the values of -1.98 and 1.98. For the calculated value t = -2.44, t <-1.98 is valid.

|	Salaries of Slovak drivers (2017)	Salaries of drivers in other EU countries (2017)
Mean	1258.48275862069	1517.45
Variance	211950.164917541	564202.387288135
Observations	116	60
df	115	59
F	0.375663360689219	
P(F<=f) one-tail	3.67123074029863E-06	
F Critical one-tail	0.696352222538976	
P (2)(F<=f) two-tail	0.0166574545714149	
F (2) Critical two-tail	1.98895978017516	

Fig. 4. T-test results (2017)
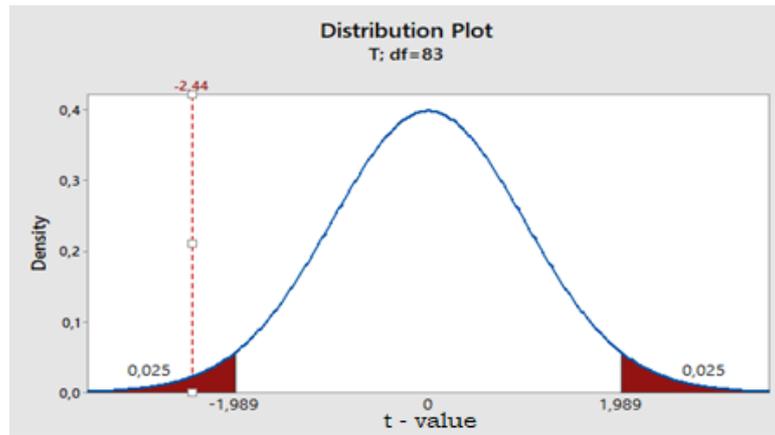
Fig. 5. Graph of Critical Values and Test Criterion t – Distribution (2017)

The test criterion value belongs to the test area $v_\alpha = \left(-\infty, -t_{1-\frac{\alpha}{2}}\right)$; therefore, at the significance level $\alpha = 0.05$, we reject the null hypothesis H_0: $\mu_1 = \mu_2$. Based on the conclusions of testing, it is possible to reject the null hypothesis that the wages of drivers in Slovakia and the wages of drivers in selected member countries are not different. The two-choice t-test proved that the wages of drivers in selected member countries in 2017 differed statistically significantly from driver wages in Slovakia, with an estimate of 95%.

3.2. Research on the average wage of drivers in 2018

The same questionnaire survey on driver remuneration in the second half of 2018 was conducted to compare drivers' year-on-year change in wages (Hungary, Austria, Germany, Norway, Luxembourg, Denmark, Italy, Netherlands, Belgium). However, for the comparability of the survey results, only the countries that were represented in the 2017 survey were considered in the following calculations.

In Slovakia, we found these drivers' wages in €: 1400; 900; 1100; 1300; 700; 1550; 1600; 1200; 1000; 1300; 1500; 1200; 1250; 950; 1000; 1250; 1600; 1450; 1800; 1800; 1550; 1400; 1600; 1450; 1700; 1500; 1250; 1550; 2300; 1500; 1250; 1600; 1850; 1600; 1450; 1500; 1400; 2200; 1500; 1300; 950; 1100; 1600; 1550; 1900; 2300; 1850; 1200; 1350; 1200; 1100; 1300; 955;1700; 1500; 1075; 1600; 1300; 1500; 1550; 1400; 1300; 1800; 1050; 2200; 1800; 1500; 1200; 1300; 1600; 873; 1400; 1500; 1900; 900; 1050; 1700 1600 850; 1350; 1400; 1900; 1650.

In selected EU countries, in the sample of n = 46, we found the following average wages of drivers in €: 2150; 2500; 1950; 2400; 2100; 1800; 1561; 934; 1600; 1800; 1238; 1100; 2100; 1350; 2100; 1900; 1200; 1400; 1950; 986; 3100; 2350; 1600; 1200; 1650; 2200; 2450; 1126; 873; 1500; 1000; 952; 1700; 1550; 1124; 1358; 1700; 1650; 1285; 1354; 1500; 2000; 1200; 1300; 1792; 2200.

At the significance level $\alpha = 0.05$, we will verify the assumption that the average wages of drivers in Slovakia are the same as the average wages of drivers in selected EU countries. To determine the appropriate test method, it is also necessary to perform an F-test to verify whether the wage variance is the same for drivers in Slovakia and drivers in other Member States [10]. As in the first case, we first verify the hypothesis H_0: $\sigma_1^2 = \sigma_2^2$ versus the bilateral alternative H_1: $\sigma_1^2 \neq \sigma_2^2$. From the selection data, we calculate the following sampling characteristics:

$\bar{x}_1 = 1434.3735$ $\tilde{s}_1^2 = 109400.1393$ $\tilde{s}_1 = 330.7569$
$\bar{x}_2 = 1648.5434$ $\tilde{s}_2^2 = 248046.0758$ $\tilde{s}_2 = 498.0422$

Since the test criterion value F = 0.4410 is less than the critical value of 0.6067, it belongs to the critical region $v_\alpha = \left(0, F_{\frac{\alpha}{2}}\right)$ For this reason, we reject the null hypothesis H_0: $\sigma_1{}^2 = \sigma_2{}^2$ and we accept the alternative hypothesis H_1: $\sigma_1{}^2 \neq \sigma_2{}^2$, which means that the wage scattering of drivers in Slovakia and selected member states at the significance level $\alpha = 0.05$ is not identical. In this case, it is not

possible to use the classical t-test, but we will use the test for non-conforming variations called Welchow t- test. The test will be carried out in the same way as in the previous survey by means of an analytical tool – a two-choice t-test with different variances in Excel.
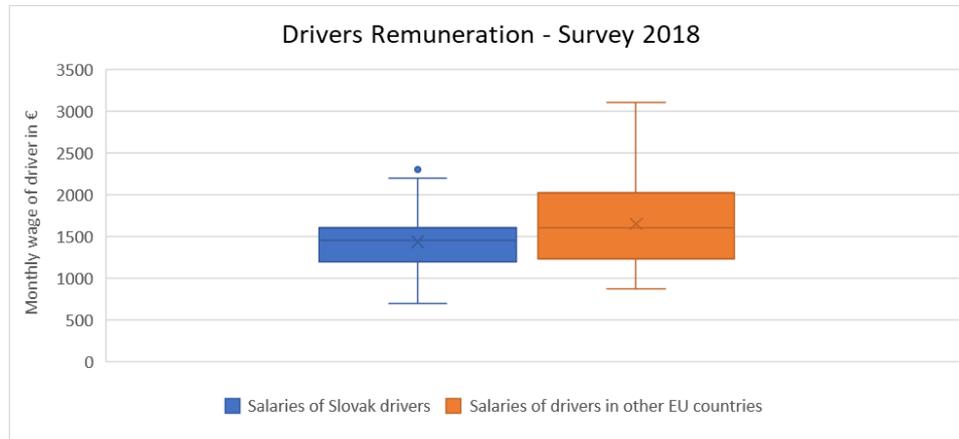

Fig. 6. Graphic representation and comparison of the drivers' remuneration survey in 2018

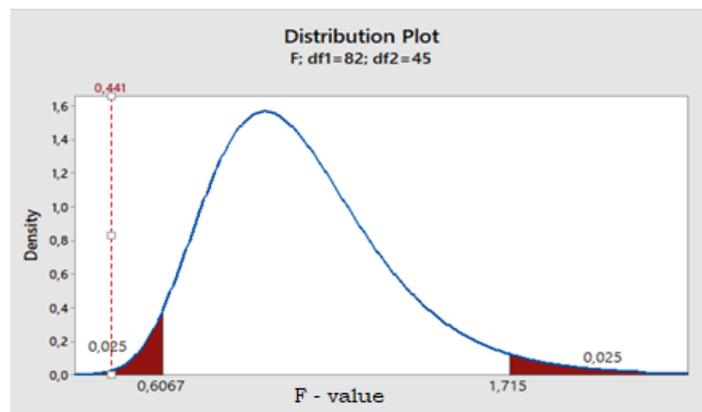$$F = \frac{\hat{s}_1^2}{\hat{s}_2^2} = \frac{109400.1393}{248046.0758} = 0.4410 \ . \tag{3}$$

Fig. 7. F-test – hypothesis testing for driver wages in 2018

	Salaries of Slovak drivers (2018)	Salaries of drivers in other EU countries (2018)
Mean	1434.3734939759	1648.54347826087
Variance	109400.139288863	248046.075845411
Observations	83	46
df	82	45
F	0.441047651796128	
P(F<=f) one-tail	0.000647993984637552	
F Critical one-tail	0.657447933574196	
P (2)(F<=f) two-tail	0.0110276864310331	
F (2)Critical two-tail	1.9960083540253	

Fig. 8. T-test results (2018)

The level of statistical significance achieved for the P (2) bilateral assay is 0.011 and is significantly less than the 0.05 level, which means that we reject the null hypothesis. For the number of degrees of freedom 67 (calculation using the analytical tool – Excel), the quantities are determined by values -1.99 and 1.99. For the calculated value t = -2.61, t < -1.99.
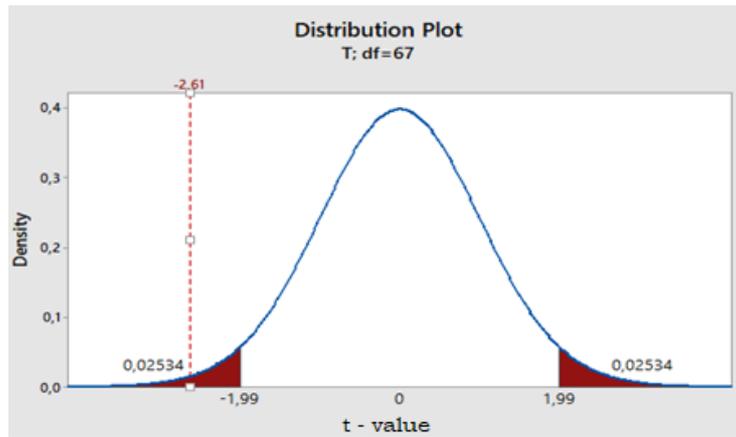
Fig. 9. Graph of Critical Values and Test Criterion t – Distribution (2018)

The test criterion value belongs to the test $\bar{x}_2 = 1517.4500$ area $v_\alpha = \left(-\infty, -t_{1-\frac{\alpha}{2}}\right)$; therefore, at the significance level α = 0.05, we reject the null hypothesis H₀: μ₁ = μ₂. Based on the compliance test, we can say with confidence 95% that the average driver's wage in the SR and other selected Member States also differs on the basis of the 2018 survey.

3.3. Assessing the results of driver remuneration research within the EU

Despite the claims of several transport companies that the difference between the wages of a driver working in Slovakia and a driver working mainly in Western Member States is minimal and there is no reason to leave drivers to work in other EU countries; in this case also, it is confirmed that driver wage levels are still lower compared to Western EU countries. Thus, we can say that one of the causes of the lack of drivers in Slovakia and therefore the departure of drivers to other countries is lower wages. Also from the survey, it was shown that the wages of Slovak drivers increased in 2018 compared to the previous year, and the final salary level in some cases approached the driver's wage in Western countries, but it should be noted that approximately half of the driver's salary in Slovakia and therefore the basic component of gross salary is at an overall lower level compared to the Western EU states. This means that sickness, nursing care or the amount of the pension is calculated by the driver from the value of his gross wage, which in many cases is at the level of 600–700 €/month. On the contrary, in the Western Member States, travel allowances represent around 10% –20% of the driver's salary, which is a significantly higher assessment base for the reported contributions.

Also, other motivating factors are the considerably higher family allowances for the child. For comparison, Figure 10 shows the representation of child allowances in selected EU Member States. It can be seen from the graph that the amount of child benefit varies considerably between EU countries.
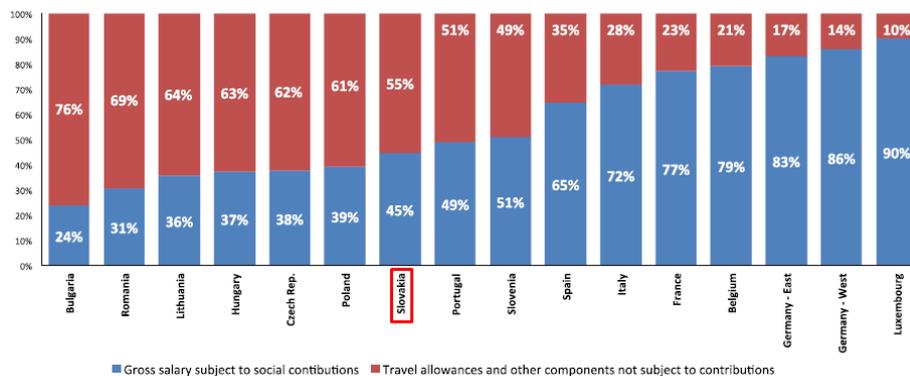

Fig. 10. Structure of driver remuneration for road freight transport in the EU (Source: CNR European Studies)
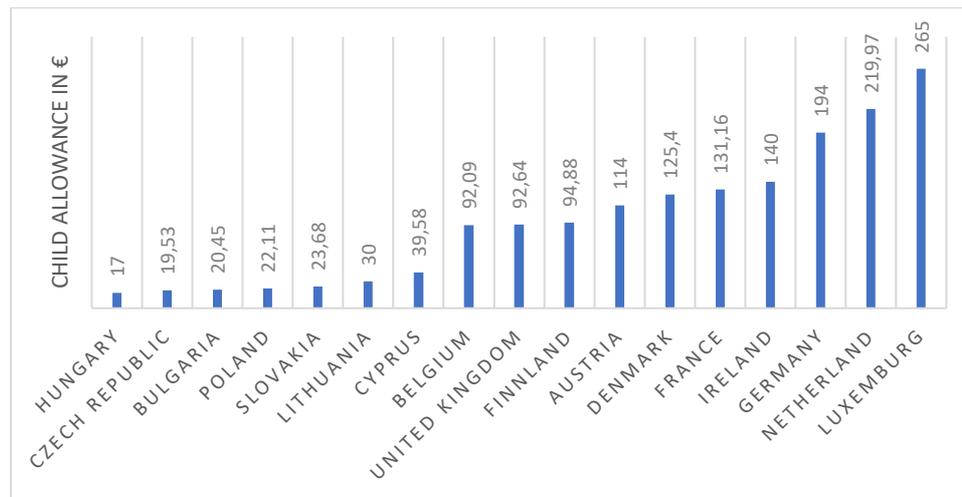
Fig. 11. The amount of child allowance in EU countries in 2018

4. CONCLUSION

This paper contributes to fill the gap in the understanding of social road harmonization. Road transport is service specific because it provides transport throughout the EU, but it is subject to the national regulations of a company headquarters. A continuing problem is the harmonization of road transport business conditions in the EU common market. The contribution identifies differences in the social field of drivers and points out that Eastern and Central EU carriers operate with lower wage costs in the same transport market as other EU countries, resulting in an increase in the number of transport companies moving their branches from the richer EU countries to Central and Eastern Europe to circumvent their country's wage demands. At the same time, surveys have pointed out that the wage of Western countries for the driver is still higher than in other EU countries, resulting in a lack of drivers working in countries with substantially lower wages. It has also been pointed out that not only the wage level itself can motivate drivers to work for transport companies based in Western EU countries, but also more attractive social benefits such as. child or child allowance the height of the measuring base.

Harmonizing the wages of international road drivers is problematic. It is not possible to reduce wages for Western European countries because they are below average wages. On the contrary, it is not possible to raise wages for the countries of the eastern and central part of the EU, because they are now well above the average wage. About the harmonization of conditions, it should be noted that the EU institutions do not have their own means to enforce EU legislation. For example, there is no pan-European labour inspectorate [13, 14]. The subsidiarity principle of work, with the privilege of enforcement, is a matter for the Member States, and therefore the EU depends on the willingness and agreement of national governments.

Acknowledgement

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