

## ROAD FREIGHT TRANSPORT ENTITIES DEALING WITH THE COVID-19 PANDEMIC

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### **Abstract**

*The road transport business has changed dramatically in the previous three years and will confront new problems in the next years. From the start of the pandemic crisis to the current geopolitical and economic uncertainty, industry players have had to constantly come up with new ways to deal with the paradigm shift and support clients. The aim of this paper is to identify, through a comparative analysis of SMEs in the road transport sector, if and how they contribute to job creation and what economic contribution they make in Romania in the context of the pandemic crisis. For this purpose, through the topfirme.com platform, the economic and financial statements of a sample of 100 enterprises were collected for the period 2016-2020. The study suggests that small firms are significantly more willing than medium and big businesses to endure financial troubles and take remedial steps in this context. However, according to the analysis, the group of tiny firms manages to cope well with uncertainties and shifting market trends in the case of the current study, based on the indicators examined.*

### **Keywords**

road freight transport; turnover; average number of employees; debts, SMEs

### **JEL Classification**

L91, M40, F23

### **Introduction**

Road haulage has been nearly vital in the performance of commercial activity from ancient times, but with the passage of time, through refinement and growth, it has asserted itself as a separate field.

Road freight transport is a critical component of the economy, both microeconomically and macroeconomically. A number of variables, such as the impact on competitiveness, contribution to costs and prices, influence on organizational activities, and so on, justify the economic importance of freight transport at the microeconomic level. A number of macroeconomic factors are in sync: the huge role and importance of transportation in the national economy; the prospect of large-scale specialization of production; and economic progress. From a societal standpoint, transportation activity promotes residents' free mobility; it also produces jobs and contributes to the economy's development (Maniu & Pantelescu, 2015).

Road haulage is the primary mode of transport for commodities in Romania, particularly over long distances. Road freight transport transports a substantial proportion of freight (land transport -26% and logistic truck transport -35%), followed by sea, rail, inland canal, and air freight transport, which ranks last due to high costs (see SafeFleet, 2019).

Recent unforeseen events have had a systemic impact on the transport sector, both in terms of passenger and road freight transport, including the eruption of Iceland's Eyjafjallajökull volcano on 14 March 2010 and the Rastatt tunnel collapse on 12 August 2017. Furthermore, the EU transport sector has been severely impacted in the previous

2-3 years by two major crises: the COVID-19 outbreak and Russia's military intervention against Ukraine. Not to be overlooked are geopolitical concerns, which affect not only road transport services but also air and sea freight firms, which are suffering from rising fuel prices (Bolintin Deal, 2022).

To minimize the spread of the pandemic, several steps have been used to restrict international and domestic travel, including physical separation, stay-at-home orders, public transportation restrictions, contact tracing and quarantine, and border closures. The lack of coordination of national policies has harmed the transportation sector by restricting cross-border transportation activities, often exacerbating the consequences of the initial shock on citizens and the economy (Marcus et al., 2021). In this regard, while an emergency plan has been developed to ensure the continuation of activity in this sector, difficulties have been encountered in terms of providing real-time information, failure to clear deliveries on time, and uncoordinated procedures to obstruct the passage of passengers (various health decals, declarations for entry into own territories) (Press release, European Commission, 2022). Indeed, as Viorel Leca, General Manager of Gebrüder Weiss in Romania, stated, all of these changes have been combined with the need for transportation industry players to keep their teams operational at all times in order to avoid delivery bottlenecks in an extremely difficult labor market, where finding staff has been a real challenge. On top of that, traffic restrictions have had a significant influence. According to some statistics, the sector has historically suffered, and recovery from the 2008 financial crisis has been particularly tough. Furthermore, Romania's development of this industry has trailed considerably behind that of several other nations in the region, and the gap has grown year after year. We can say that there is a direct link between sector development and infrastructure investment (see [stareanatiunii.ro](http://stareanatiunii.ro)).

In terms of SMEs in the road haulage industry in Romania, there were 37,981 enterprises functioning in this area in 2020, accounting for 1.78% of all economic agents in Romania (see [www.adroltenia.ro](http://www.adroltenia.ro)). We may say that this is a relatively low percentage, possibly inconsequential, but with a fairly considerable contribution to the evolution and development of other areas of activity such as production and trade, forming a whole and improving the Romanian economy's development.

The study consists of four main sections: the next section empirical aspects related to the literature review. The third section aims to describe the methodological aspects and the final section focuses on the interpretation of the results, by discussing them taking into account the validation of the research hypotheses, in order to draw the related conclusions.

## **Literature review**

Lately, more and more freight companies are carrying out studies to reduce CO<sub>2</sub> emissions. These studies show that in order to achieve sustainable transport, the use of less polluting modes of transport (such as rail transport) and the optimisation of freight transport systems must be taken into account (Pamucar et al., 2022).

Previous studies (Hurduzeu et al., 2021; Aivaz et al., 2022) primarily focus on the presentation and analysis of statistics on the performance of Romanian SMEs in comparison to the overall EU SME average, whereas other studies (Paprocki & Letkiewicz, 2020) make a diagnosis of the situation in road transport while also outlining possible change scenarios.

The study conducted by Belu and Arțavulea (2016) also identifies the main barriers faced by SMEs in Romania, the most significant of which are: bureaucracy and excessive taxation, with a percentage of over 50% among entrepreneurs, elements for corruption, excessive controls, and unfair competition, with a percentage of 40% among entrepreneurs (CNIPMMR, 2016).

Much research is being undertaken to better understand the impact of COVID-19 on SMEs in Romania (Rusu & Nucu, 2020; Stefănescu et al., 2022), in which case an analysis of all sectors affected by the pandemic, including transportation, was conducted.

Some recent studies (Scarișoreanu & Ghiculescu, 2023) also focus on the exposure of threats in terms of climate change, with the transportation sector representing on the one hand a country's economic growth, the development of global trade relying on this sector (Jansuwan et al., 2021), and on the other being one of the major sources of pollution.

### Research methodology

We employed mediated data collection methods with the help of the website [www.topfirme.com](http://www.topfirme.com) to collect economic and financial data to develop a database consisting of a sample of 100 SMEs working in the industry of freight transport. Thus, we applied statistical approaches based on the acquired data, and the processed data assisted in the building of an economic model using the statistical program SPSS version 26.

In order to establish the sample for the study, we have drawn up a top list of companies from which we have selected the top 100 companies, which are ordered by average number of employees. The following economic and financial indicators were examined for each company from 2016 to 2020: average number of employees, turnover, net profit/loss, revenue, expenses, equity, total fixed assets, current assets, accounts receivable, debts, provisions, and leverage. The current study is consistent with the study conducted by Switała and Ukasiewicz (2021), in which the authors demonstrated that the destructive effects of the pandemic were felt on the activities carried out in the field of road transport, which could be seen in both reduced demand for transportation services and the worse financial condition of the studied companies.

Following that, a statistical analysis was carried out, with the use of standard descriptive statistics measures such as frequency distributions, arithmetic means, and standard deviation means, among others. The variables were additionally correlated using multivariate linear regression and the Ordinary Least Squares approach. The SPSS statistical program was used to analyze the data.

### Results and discussion

Following the sample of 100 companies, we designed an econometric model with the variable's turnover, average number of employees, revenues, expenses, current assets, accounts receivable and debts, the values being expressed in RON. According to Table 1, the highest correlation is between turnover and current assets (value 0.910). Also, there is a strong correlation between the turnover and average number of employees, with a value of 0.861.

**Table 1 Correlation Matrix**

		Average number of employees	Revenue	Expenditures	Current assets	Accounts receivable	Debts	
Pearson Correlation	Turnover	1.000	.861	.837	.836	.910	.877	.785
	Average number of employees	.861	1.000	.768	.768	.845	.817	.714
	Revenue	.837	.768	1.000	.998	.819	.835	.728
	Expenditures	.836	.768	.998	1.000	.815	.835	.731
	Current assets	.910	.845	.819	.815	1.000	.968	.831
	Accounts receivable	.877	.817	.835	.835	.968	1.000	.809
	Debts	.785	.714	.728	.731	.831	.809	1.000

Source: Own processing via SPSS vs 26

The very strong correlation between turnover and current assets is driven by fluctuations in current assets. There is a strong correlation between turnover and the other indicators (average number of employees, revenues, expenses, receivables and payables), as the increase/decrease in turnover is influenced by the situation of each indicator. For example, if revenue falls, receivables and turnover fall, and if the drop is considerable and long-lasting, it is reflected in the year-end result, which should prompt an examination of the management of the activity.

The next step after data analysis was the validation of the regression model. Thus, the developed model analyses the dependency correlation between turnover and the independent variables: average number of employees, revenues, expenses, current assets, accounts receivable and debts. Therefore, the proposed model has the form:

$$\text{Turnover} = \alpha + \beta_1 * \text{Average number of employees} + \beta_2 * \text{Revenue} + \beta_3 * \text{Expenses} + \beta_4 * \text{Current assets} + \beta_5 * \text{Accounts receivable} + \beta_6 * \text{Debts} + \varepsilon \quad (1)$$

Where:

- Turnover - dependent variable of the model;
- Average number of employees, revenues, expenses, current assets, accounts receivable and debts – independent variables;
- $\alpha$ ,  $\beta_1$ ,  $\beta_2$ ,  $\beta_3$ ,  $\beta_4$ ,  $\beta_5$  and  $\beta_6$  – the parameters of the regression model;
- $\varepsilon$  – the random error variable.

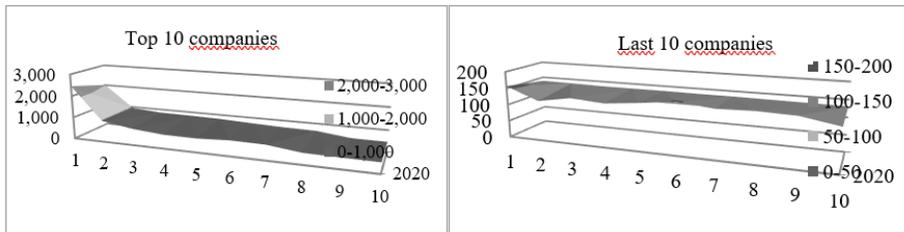
Next, the descriptive analysis of the model variables was carried out and is presented in Table 2:

**Table 2 Descriptive Statistics**

	Mean	Std. Deviation	N observation
Turnover	105962144.71	122943437.595	484
Average number of employees	283.85	264.721	484
Revenue	108685746.05	110879561.529	484
Expenditures	104904404.34	109492137.315	484
Current assets	27990995.20	36068180.851	484
Accounts receivable	23268365.16	26816719.822	484
Debts	39704553.42	51321258.750	484

Source: Own processing via SPSS vs 26

To conduct the dynamic analysis, we selected the top 10 and last 10 companies in the transportation sector from the database, taking into account the average number of employees, in order to compare the values in 2020 with 2019, assessing the effects of the crisis on economic activity and the contribution of each indicator to turnover (see Figure 1). The names of the entities can be seen in Annex 1.

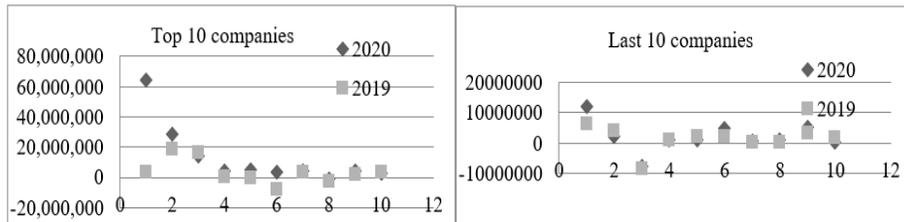


**Figure 1 Evolution of the sample according to the average number of employees in 2019-2020**

Source: Own processing based on collected data

As can be seen in Figure 1, both in the case of companies with a higher number of employees (top 10) and in the case of companies with fewer employees (bottom 10) it is visible that this health crisis that started in 2020 has had a negative impact that according to some statistics (National Commission for Strategy and Forecasting, 2020) in the case of the transport sector is expected to have high intensity negative effects, considerably reducing the demand for labour. These decreases in labor demand are critically dependent on the level of income, the expansion of social contacts, the refinement of consumption, or the allocation of financial resources within investment flows, on the one hand, and the presence of complex supply chains, on the other (Vasile et al., 2020).

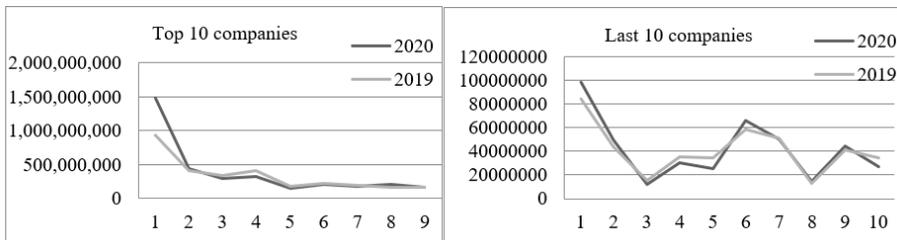
The vast majority of the enterprises studied indicate a variation, so that in 2020, due to substantial bottlenecks, each of them was compelled to curtail its activities, resulting in a decline in the workforce.



**Figure 2 Evolution of the sample according to the results of the exercise in 2019-2020**

Source: Own processing based on collected data

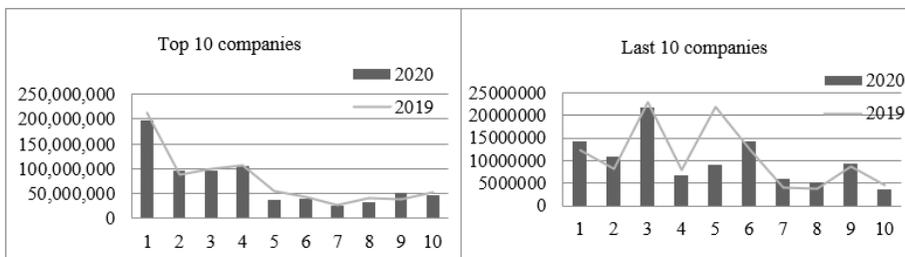
Analysing Figure 2, we see that the top 5 companies out of the top 10 of the top 100 companies made a profit in 2020 as opposed to the next 5 companies that also made a loss. In this case, we can see that the last 10 selected companies performed more favourably, with only one company making a loss in the two years, the rest making a profit. In both cases, we see that 80-90% of each company's results reflect the positive or negative effects of this pandemic, which disrupted activity or encouraged openness to new opportunities in their business.



**Figure 3 Evolution of the sample according to turnover in 2019-2020**

Source: Own processing based on collected data

The analysis of turnover shows that in 2020 compared to 2019 turnover shows a slight decrease, which is motivated by the onset of the Covid-19 pandemic, when in the period March 2020 - May/June 2020 most of the activities were reduced or even interrupted, which had indirect repercussions on the transport sector, as the supply chain is directly linked to this sector.

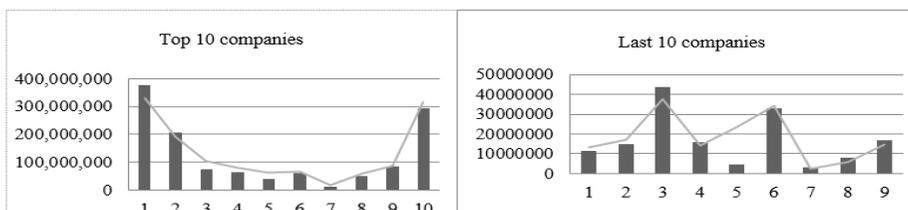


**Figure 4 Evolution of the sample according to accounts receivable in the period 2019-2020**

Source: Own processing based on collected data

As far as receivables are concerned, as we can see in Figure 4, their percentage is lower in 2020 than in 2019. The decrease in activity has also led to a decrease in receivables, with a much greater fluctuation being observed in the case of the top 10 companies compared to the bottom 10 companies, which denotes that large entities have been much more affected, the impact being more visible on them, also influenced by the number of employees, the amount of debt and a much greater volume of activity. One explanation would be that the group of small entities were perhaps more likely to face financial difficulties and take corrective action than medium and large enterprises.

As shown in Figure 5 above, the debts of the entities analysed tended to increase for each company, which indicates that with the decrease in receivables (own sources of financing), the entities in question had to turn to a borrowed source of financing in order to be able to carry out their activities in normal conditions.



**Figure 5 Evolution of the sample according to debts between 2019-2020**

Source: Own processing based on collected data

Analysing each of the above figures, which takes into account the evolution of the economic and financial indicators, it can be seen that every company has been affected by this health crisis regardless of its size. It can be seen from Figure 1 that companies in this sector maintained their number of employees in 2020, moreover if we refer to the other economic indicators, we find that in some cases their values have not decreased but have been maintained or even increased, which denotes that there is a strong correlation between turnover, number of employees and the rest of the indicators analyzed.

**Table 3 Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.937 <sup>a</sup>	.878	.877	43198344.637	.968

<sup>a</sup> Predictors: (Constant) Average number of employees, Revenues, Expenses, Current assets, Accounts receivable and Debts

<sup>b</sup> Dependent Variable: Turnover

Source: Own processing via SPSS vs 26

According to Table 3 we find that for the analyzed model the correlation ratio value is 0.937, which denotes that between the dependent variable turnover and average number of employees, revenue, expenses, current assets, receivables and payables there is a strong intensity of correlation, all of which contribute to their image and development. The value of the determination ratio is 0.878, which means that this linear multiple model is 87.8% explained by the average number of employees, revenue, expenses, current assets, receivables and payables. In the table above we also find the Durbin - Watson coefficient value of 0.968. Table 4 below presents information that helps us to validate the model.

**Table 4 ANOVA**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6410459654245576700.000	6	1068409942374262780.000	572.537	.000 <sup>b</sup>
	Residual	890128259146159740.000	477	1866096979342054.000		
	Total	7300587913391736800.000	483			

Source: Own processing via SPSS vs 26

According to Table 5, the components of variation have the following values: estimated explained variation 6.410E+18, estimated residual variation 8.901E+17 and estimated total variation 7.300E+18. The Fisher coefficient value is very high,  $F = 572.537$ , and the Sig. value for the F-test is less than 0.05, so the constructed model explains the significant dependence between turnover, average number of employees, revenue, expenses, current assets, receivables and payables by a multiple linear relationship. This model is 95% validated.

**Table 5 Model coefficients**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	690203.555	3289600.872		.210	.834
	Average number of employees	113865.970	14463.526	.245	7.873	.000

Revenue	-.371	.298	-.335	-1.246	.213
Expenditures	.658	.303	.586	2.172	.030
Current assets	2.523	.258	.740	9.772	.000
Accounts receivable	-1.279	.318	-.279	-4.018	.000
Debts	.086	.071	.036	1.216	.225

Source: Own processing via SPSS vs 26

With the aid of the coefficients the estimated equation of the model will be constructed, it having the form:

$$\text{Turnover} = 690203,555 + 113865,970 * \text{Average number of employees} - 0,371 * \text{Revenue} + 0,658 * \text{Expenditures} + 2,523 * \text{Current assets} - 1,279 * \text{Accounts receivable} + 0,086 * \text{Debts} \quad 2)$$

The econometric interpretation of the model obtained provides the following information on how the variation in turnover is influenced by the influencing factors considered:

- If the average number of employees rises by one person while the other variables stay unchanged, turnover rises by 113865,970 RON. This increase in turnover with an increase in the number of employees indicates an increase in the volume of activity while also expanding activity, highlighting the close relationship between turnover and the average number of employees.
- If revenues increase by one RON while the other variables remain constant, turnover decreases by 0.371 on average. This situation is only possible when revenues increase while the other revenues that are not from current activity and the operating revenues that make up turnover remain constant or even decrease.
- If expenses rise by one RON while all other variables remain constant, turnover rises by 0.658 RON on average, because turnover can be indirectly influenced by specific changes in each activity, such as an increase in selling price or an increase in some fixed or variable expenses, which ultimately affect turnover.
- If the current assets increase by one RON while the other variables remain constant, the turnover increases by 2.523 RON on average. We can see a close relationship between the elements that comprise the current assets and their contribution to the increase in turnover, for example, if a company has recorded an increase in trade receivables, we can see that an income has been generated, which also leads to an increase in turnover.
- If receivables rise by one RON and all other variables stay constant, turnover falls by 1.279 RON on average. This condition can occur in businesses that report receivables other than trade receivables, such as advances or state budget receivables.
- If debts rise by one RON while all other factors remain constant, turnover falls by 0.086 RON on average, which is the result we discover in most circumstances and is also natural from a theoretical standpoint. We observe that in recent years, enterprises have increasingly turned to external financing to ensure the continuity of their operations.

Analyzing the model obtained, it is observed that turnover is most influenced by the average number of employees, current assets and receivables because all 3 elements work in a close relationship, so once one of the variables changes, the others change, these being the main economic indicators followed in the analysis of a company's performance. Turnover is influenced by the average number of employees because the increase or decrease in productivity in most cases is closely linked to the number of employees, we could say that in the road haulage sector, employees are the main factor influencing turnover.

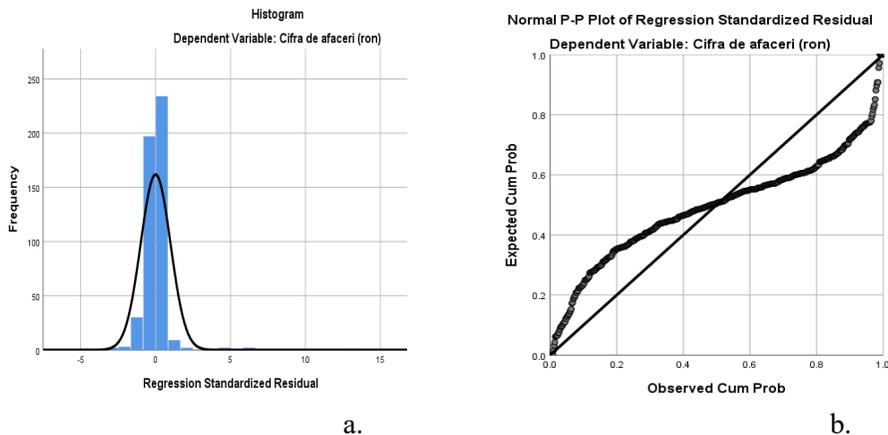
Table 6 shows information on residual values. The lowest value of the residual is -215546560 and the highest value is 572195904.

**Table 6 Residuals Statistics**

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1049632.38	1115737088.00	105962144.71	115204918.286	484
Residual	-215546560.000	572195904.000	.000	42929193.452	484
Std. Predicted Value	-.911	8.765	.000	1.000	484
Std. Residual	-4.990	13.246	.000	.994	484

Source: Own processing via SPSS vs 26

According to Figure 6a, it can be seen that the error histogram follows a normal distribution, slightly shifted to the right.



**Figure 6a,b Histogram of errors and P-P Plot Diagram**

Source: Own processing via SPSS vs 26

Analyzing the histogram of the errors, it is observed that it has a normal distribution between -0.3 and 3, but slightly shifted to the right which shows that in the analysis of the turnover variable the selected data are correct which led to the illustration of the Gaussian bell.

According to Figure 6b, the P-P Plot has shifts with respect to the specific theoretical distribution representing Henry's line. Also, the representation of the points is more shifted from the theoretical distribution by having an intersection point on the axis which shows that the turnover data is correct since it is ordered upwards we have an ordered distribution.

The preceding demonstrates that excellent management and leadership of road haulage SMEs is mostly dependent on well-organized human resource management. As mentioned in the analysis of the number of employees, I believe they contribute the most to the development of SMEs in this sector, but with the health crisis that began in 2020, the negative effects began to spread among entities in the transportation sector, which had to limit their activity and reduce the number of jobs. At the same time, we see that the average number of employees, together with the other indicators studied, has a substantial influence on the increase/decrease in turnover.

On the other hand, given that the pandemic crisis has had a significant impact on all areas of activity, we believe that its effects will be felt in the coming years, a scenario that certainly applies to road freight transport, even though the negative effects have been felt in some cases since 2020. Following this investigation, we discovered that entities had a greater proclivity to contract external money to support their activities in 2020 compared to the previous year. The study also reveals that small businesses are more willing than medium and big businesses to endure financial difficulties and adopt remedial steps in this environment. However, the analysis shows that, in terms of the parameters examined, the group of tiny firms manages to cope well with the uncertainties and shifting market trends in the case of the current study. In comparison to the period studied (when bottlenecks and restrictions on cross-border movements were imposed), the situation improved in the following period, namely the second quarter of 2021, and the number of tonne-kilometres carried in the EU increased by 7%, according to statistics Eurostat (2022).

## Conclusions

The entire globe is debating global catastrophes, from political corridors to academic platforms: a health crisis, an economic and financial crisis, a climate crisis, and a nature disaster. Finally, they are all symptoms of the same problem: our unsustainable production and consumption practices. The shock of the COVID-19 pandemic has merely shown the global economy's and our society's systemic fragility, with all of its disparities. Road freight transport was one of the businesses hardest hit by the coronavirus epidemic in 2020. This is supported not only by our own study findings, but also by statistics data indicating a general drop in demand for road freight transport. conveyance of goods by road.

Demand for transportation services is projected to increase as limitations are lifted and activity gradually resumes. However, the rate of development will vary based on service providers' sectoral specialization, as well as the rate of recovery in primary markets, investments undertaken to combat the virus, and the sustainability of changes in the road sector.

While the COVID-19 pandemic caused a marginal decline in turnover in 2020 (more food retail items at the expense of durable goods), 2021 is expected to see not just a recovery but a significant advance based on volume growth and significant transmission of inflationary pressures throughout the supply chain. However, rising raw material, fuel, utility, finance, and labor costs will cause a shift in profit margins.

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**Appendix****Appendix 1 Entities included in the sample**

<b>No.</b>	<b>Top 10 entities</b>	<b>Last 10 entities</b>
1.	AQUILA PART PROD COM S.R.L.	DORU SI FLORIN S.R.L
2.	INTERNAȚIONAL ALEXANDER S.R.L.	GROUP CONCIF S.R.L.
3.	SKIPTRANS S.R.L.	AUTOVEST TRANS S.R.L.
4.	DUVENBECK LOGISTIK S.R.L.	CAPITALY TAXI S.R.L.
5.	MEGA TRUCKING TIMISOARA S.R.L.	VIDAXL CENTER S.R.L.
6.	QUEHENBERGER LOGISTICS ROU S.R.L.	BLUE RIVER BUCURESTI 78 S.R.L.
7.	H E S S E R S S.R.L.	TRUCK SUPPLY EUROPE S.R.L.
8.	GARTNER EUROTRANS ROMANIA S.R.L.	PRO NATUR S.R.L.
9.	DUNCA EXPEDITII SA	LG TRANS S.R.L.
10.	DOLO TRANS OLIMP S.R.L.	GIRO S.R.L