

# THE IMPACT OF THE COVID-19 EPIDEMIC ON THE FINANCING STRUCTURE OF ROMANIAN COMPANIES (PART II)

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**Abstract:** The unexpected nature of the COVID-19 pandemic and the strict measures to protect the population during it have, put decision makers in economic entities to a severe test. Their main challenge was to provide the most appropriate mix of funding sources for the business run. In the second part of 2020, data was collected using a questionnaire to record the impact of this epidemic on Romanian economic entities. Through statistical processing, this study sought to identify the factors leading to the change in the financial structure between March and May 2020. The results of the study show that companies used trade credit and state funding programmes to a higher proportion, while domestic sources of funding declined in terms of use the more the operational activity of the company was affected in terms of funding. As regards the importance given to funding sources between March and May 2020, this depends on the following factors: perception of the epidemic's influence on financing needs, if the operational activity was affected in terms of funding, the extent to which access to finance was a pressing problem, turnover, average number of employees, duration of activity.

**Keywords:** sources of financing, COVID-19 epidemic, access to finance, need for funding, operational activity.

## 1 INTRODUCTION

The health crisis stemming from the COVID-19 epidemic has affected the economic environment, affecting economic entities differently.

Put in the position of counteracting the negative effects of the epidemic, companies had

to react, and one of the levers at hand was to adapt the financing structure to the new economic conditions. As previously used sources of funding were no longer available to the same extent, firms were put in a position to find other solutions.

In view of these considerations and based on the results obtained from the processing of

the questionnaire designed by the authors to measure the impact of the epidemic, this study focuses on analysing the factors considered relevant and which influenced the financing structure of companies during the COVID 19 epidemic.

Thus, this study aims to identify the existence of links between:

a) Influence of the COVID-19 epidemic on operational activity in terms of funding and the importance given to funding sources used between March and May 2020;

B) Access to finance between March and May 2020 and the importance given to the funding sources used during this period;

C) The importance given to the sources of funding used between March and May 2020 from the perspective of the following factors: perception of the influence of the epidemic on financing needs, if the operational activity was affected in terms of financing, measure where access to finance was a pressing problem, turnover, average number of employees, duration of activity.

The aim is to identify the factors that led to the change in the financial structure between March and May 2020.

In order to test the link between different factors obtained from the processing of the questionnaire, we considered doing statistical analyses based on estimates of multiple linear regressions by Stepwise Least Squares method.

## 2 THEORETICAL BACKGROUND

The influence factors of the capital structure have been analysed through a series of studies and research. We note some of these that we considered relevant to this study.

The influence of profitability on the capital structure is empirically tested in the study by Harris and Raviv (1991). Based on empirical findings in the USA, the results of this study indicate a negative correlation between leverage and profitability. Also, the conclusions of Jong et

al. (2008) are consistent with the pecking order theory, according to which companies first use retained profits to finance new investments and then focus on debt and equity if necessary.

The link between the duration of the business (the age of the company) and the degree of indebtedness is analysed in the report of the European Central Bank (2013). According to this report, companies that are less than five years old have a higher degree of indebtedness than old companies and companies over 25 years old have a lower degree of indebtedness. It also confirms other results showing that young firms rely more on external financing and the leverage is about four percentage points higher than that of older companies.

Regarding the influence of the company's size on the capital structure, Harris and Raviv (1991) pointed out that the size of the company is positively correlated with the degree of indebtedness. Titman and Wessels (1998) argue that the size of the company and the degree of indebtedness are positively correlated, on the grounds that large companies have a lower risk of bankruptcy, which allows them to reach and maintain a higher level of debt. Jong et al. (2008) also notes that the size of the company has a positive effect on the degree of indebtedness. The authors explain this by the fact that larger firms are usually more diversified and have more stable cash flows, and can afford a higher level of indebtedness. Frank and Goyal (2009) also claim that large firms tend to have a high degree of indebtedness.

## 3 RESEARCH METHODOLOGY

Based on the results obtained from the processing of the questionnaire, we have carried out a series of statistical analyses to determine whether there are significant links between different factors.

To this end, we resorted to multiple linear regression analysis by Stepwise method. By this method, variables are entered in order in the

model and shall be tested if they contribute to the suitability of the model. After each inclusion phase, all variables in the model are retested to see if they still contribute to the success of the model. If they no longer contribute significantly, they shall be removed. This method allows to obtain the smallest possible set of predictor variables included in the model.

The statistical analyses using the Stepwise method were made using the statistical program IBM SPSS Statistics 20.

#### 4 ANALYSIS AND RESULTS

The link between the influence of the COVID-19 epidemic on operational activity in terms of funding and the importance given to the funding sources used between March and May 2020 is analysed using Stepwise regression model.

In this analysis we describe the steps taken, while presenting the results achieved.

The first table Variables entered/Removed allows us to view predictors included in the model and their order of introduction.

Table 1. Variables Entered/ Removed: Stepwise regression regarding the influence of the COVID-19 epidemic on operational activity in terms of funding

Variables Entered/Removed <sup>a</sup>			
Model	Variables Entered	Variables Removed	Method
1	State funding programmes		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
2	Retained earnings or sale of assets		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a. Dependent Variable: Operational activity

As can be seen, two models have been generated using the Stepwise method. The first model contains the predictor „State financing programs” and the second model was built on the basis of this predictor, plus the second predictor „Retained earnings or sale of assets”. Generally, the model that contains a higher number of predictors is retained.

The Summary Model Table contains information on the correlation coefficient and the standard estimate error. The coefficient of determination  $R^2$  (R Square) expresses how much percent of the variance of the dependent variable can be explained by the model. The table also contains some statistical information reflecting the improvement of the model.

Table 2. Model Summary: Stepwise regression regarding the influence of the COVID-19 epidemic on operational activity in terms of funding

Model Summary <sup>c</sup>									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.462 <sup>a</sup>	0.213	0.205	0.952	0.213	26.815	1	99	0.000
2	.540 <sup>b</sup>	0.292	0.277	0.908	0.079	10.889	1	98	0.001

a. Predictors: (Constant), State funding programmes

b. Predictors: (Constant), State funding programmes, Retained earnings or sale of assets

c. Dependent Variable: Operational activity

The first predictor included in the model explains the variation of the dependent variable in the ratio of 20.5%. The second predictor introduced into the equation justifies an additional 7.9% of the variation of the dependent variable (the change in the value of  $R^2$  is 0.079). Thus, the second model shows that the two predictors (the importance given to state funding programmes, respectively retained earnings or sale of assets) simultaneously explain 29.2% of the variation of the dependent variable, respectively the influence of the COVID-19

epidemic on the operational activity in terms of financing.

Analysis of variance tests is quite popular in regression analysis and one of these is the ANOVA test. The values of the indicators specific to the ANOVA analysis are: amount of variation, number of degrees of freedom, value of F statistics and unilateral critical probability.

The following table shows the results of the ANOVA analysis indicating that the model is statistically significant because  $p < 0.001$ .

Table 3. ANOVA: Stepwise regression regarding the influence of the COVID-19 epidemic on operational activity in terms of funding

ANOVA <sup>a</sup>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	24.309	1	24.309	26.815	.000 <sup>b</sup>
	Residual	89.750	99	0.907		
	Total	114.059	100			
2	Regression	33.285	2	16.642	20.191	.000 <sup>c</sup>
	Residual	80.775	98	0.824		
	Total	114.059	100			

a. Dependent Variable: Operational activity

b. Predictors: (Constant), State funding programmes

c. Predictors: (Constant), State funding programmes, Retained earnings or sale of assets

In the Coefficients Table, the calculated regression coefficients (including standardised Beta coefficient) and the results of their materiality tests are shown. The information in the table below also allows us to check the multicollinearity in

multiple regression model. In this respect, we examine the variance inflation factors (VIF) or the tolerances of the explanatory variables. For variables included in the model the tolerance should be  $> 0,1$  (or  $VIF < 10$ ).

Table 4. Coefficients: Stepwise regression regarding the influence of the COVID-19 epidemic on operational activity in terms of funding

Coefficients <sup>a</sup>								
Model		Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics		
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	0.763	0.232		3.284	0.001		
	State funding programmes	0.343	0.066	0.462	5.178	0.000	1.000	1.000

2	(Constant)	1.515	0.318		4.767	0.000		
	State funding programmes	0.345	0.063	0.463	5.450	0.000	1.000	1.000
	Retained earnings or sale of assets	-0.256	0.078	-0.281	-3.300	0.001	1.000	1.000

The positive value of the coefficient indicates the existence of a link of the same meaning between the dependent variable and the predictor, and the recording of a negative value reflects the existence of a contractual meaning link between them.

The Excluded Variables Table provides some statistical information on the variables not included in the model. We note, therefore, that the importance granted to the other types of financing is not considered to be significant predictors of the dependent variable.

Table 5. Excluded Variables: Stepwise regression regarding the influence of the COVID-19 epidemic on operational activity in terms of funding

		Excluded Variables <sup>a</sup>				Collinearity Statistics	
Model		Beta In	t	Sig.	Partial Correlation	Tolerance	VIF
1	Retained earnings or sale of assets	-.281 <sup>b</sup>	-3.300	0.001	-0.316	1.000	1.000
	Social capital increase	-.080 <sup>b</sup>	-0.881	0.380	-0.089	0.971	1.030
	Shareholder loans	.039 <sup>b</sup>	0.430	0.668	0.043	0.996	1.004
	Loans with a guarantee of credit guarantee funds	-.155 <sup>b</sup>	-1.716	0.089	-0.171	0.961	1.041
	Bank loan	-.047 <sup>b</sup>	-0.471	0.639	-0.047	0.807	1.239
	Bank overdraft and credit line	-.054 <sup>b</sup>	-0.518	0.605	-0.052	0.745	1.342
	Trade credit	.031 <sup>b</sup>	0.296	0.768	0.030	0.715	1.398
	Leasing	-.048 <sup>b</sup>	-0.516	0.607	-0.052	0.939	1.065
	Factoring	.083 <sup>b</sup>	0.925	0.357	0.093	0.991	1.009
	European funds	-.152 <sup>b</sup>	-1.714	0.090	-0.171	0.989	1.011
	Bond issues	-.197 <sup>b</sup>	-2.235	0.028	-0.220	0.986	1.014
2	Social capital increase	-.041 <sup>c</sup>	-0.471	0.639	-0.048	0.952	1.050
	Shareholder loans	.067 <sup>c</sup>	0.780	0.437	0.079	0.986	1.014
	Loans with a guarantee of credit guarantee funds	-.094 <sup>c</sup>	-1.061	0.291	-0.107	0.911	1.098
	Bank loan	.044 <sup>c</sup>	0.445	0.657	0.045	0.744	1.344
	Bank overdraft and credit line	.089 <sup>c</sup>	0.830	0.408	0.084	0.628	1.593
	Trade credit	.119 <sup>c</sup>	1.147	0.254	0.116	0.673	1.485
	Leasing	-.040 <sup>c</sup>	-0.456	0.649	-0.046	0.938	1.066
	Factoring	.080 <sup>c</sup>	0.939	0.350	0.095	0.991	1.009
	European funds	-.078 <sup>c</sup>	-0.869	0.387	-0.088	0.908	1.102
	Bond issues	-.163 <sup>c</sup>	-1.910	0.059	-0.190	0.969	1.032

Finally, we checked if errors are normally distributed by using graphical inspection.

As can be seen in the graph below, the shape of the histogram follows quite well the shape of the normal curve but there are small deviations. However, the presumption of

normality of error distribution appears to be reasonable. Graph P-P Plot shows that the points generally follow the normal (diagonal) line without strong deviations. This indicates that residues are normally distributed.

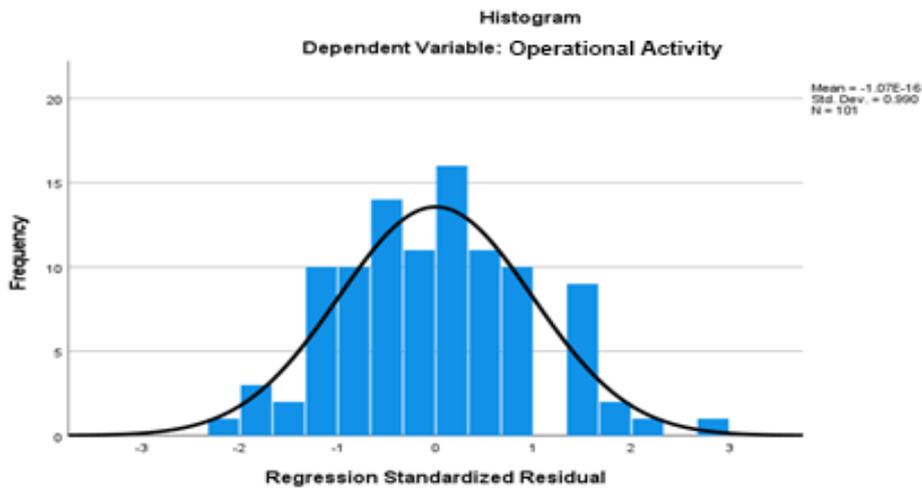


Figure 1. Histogram of the influence of the COVID-19 epidemic on operational activity

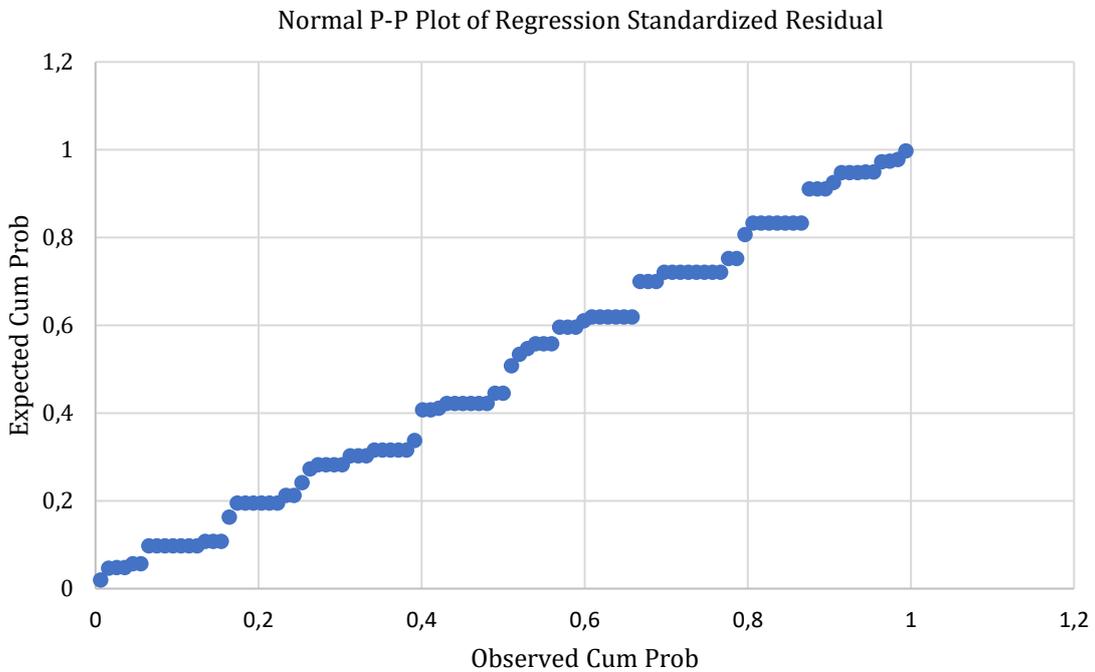


Figure 2. Chart P-P Plot – influence of the COVID-19 epidemic on operational activity

In conclusion, based on the results obtained, the regression equation may take the following form:

$$D = 1.515 + 0.345 * P_1 - 0.256 * P_2 \quad (1)$$

where:

D - dependent variable (influence of the COVID-19 epidemic on funding operational activity)

P<sub>1</sub> - predictor (significant degree attributed to state funding programmes between March and May 2020)

P<sub>2</sub> - predictor (significant degree attributed to retained earnings or sale of assets between March and May 2020)

The interpretation of the model is as follows: the more the operational activity of the company has been affected in terms of financing, the more important companies attach to government funding programmes, respectively less importance to internal sources of funding.

In the next step, we wanted to consider whether the importance given to the funding sources used between March and May 2020 influenced the extent to which access to finance was seen as a pressing problem during this period. Companies' assessment of this measure has been quantified using a five-stage scale ranging from „not at all” to „very large”.

As can be seen in the table below, the first predictor included in the model was the degree of importance given to state funding programmes that explain 26.7% of the variation of the dependent variable (R<sup>2</sup>=0.267). With the introduction of the second predictor, the degree of importance given to internal funding sources was obtained the final model, according to which the simulated contribution of the two predictors explains 29.7% of the variation of the dependent variable (R<sup>2</sup>=0.297).

Table 6. Stepwise regression: access to finance between March and May 2020 and the importance given to sources by funding used during this period.

Model Summary <sup>c</sup>									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.524a	0.275	0.267	0.755	0.275	37.489	1	99	0.000
2	.558b	0.311	0.297	0.740	0.036	5.166	1	98	0.025

a. Predictors: (Constant), State funding programmes

b. Predictors: (Constant), State funding programmes, Retained earnings or sale of assets

c. Dependent Variable: Access to finance

Coefficients <sup>a</sup>								
Model		Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics		
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
2	(Constant)	1.125	0.259		4.345	0.000		
	State funding programmes	0.323	0.052	0.525	6.264	0.000	1.000	1.000
	Retained earnings or sale of assets	-0.144	0.063	-0.191	-2.273	0.025	1.000	1.000

a. Dependent Variable: Access to finance

Therefore, the greater extent to which access to finance was considered a pressing problem between March and May 2020 is associated with a higher level of importance attributed to the state funding programmes, respectively to a lower degree of importance for retained earnings or sale of assets.

Next, using multiple Stepwise regression, we analyse the factors that influence the importance of funding sources used between March and May 2020.

Therefore, we test whether the importance given to the funding sources used between

March and May 2020 depends on the following factors: perception of the influence of the epidemic on financing needs, if the operational activity was affected in terms of financing, the extent to which access to finance was a pressing problem, respectively indicators of the company represented by turnover, average number of employees and duration of activity.

The table below summarises the information obtained from the analysis undertaken using the Stepwise statistical method.

Table 7. Stepwise regression of the importance predictors granted to the funding sources used between March and May 2020.

<b>Dependent Variable:</b>	R						
	Square	P1	P2	P3	P4	P5	P6
Retained earnings or sale of assets	0.158		(-)		(+)		
Social capital increase	0.173				(+)		(-)
Shareholder loans	0.105						(-)
Loans with a guarantee of credit guarantee funds	0.205				(+)		
Bank loan	0.253				(+)		(+)
Bank overdraft and credit line	0.253					(+)	(+)
Trade credit	0.275			(+)			(+)
Leasing	0.188				(+)		
Factoring	0.125					(+)	
European funds	0.146				(+)		
State funding programmes	0.425			(+)			(+)
Bond issues	0.118	(+)					(-)
Stock issues on the capital market	#						
Venture capital funds	#						

P1. Predictors: Perception of the epidemic's influence on financing needs

P2. Predictors: Whether the operational activity has been affected in terms of funding

P3. Predictors: The extent to which access to finance has been a pressing problem

P4. Predictors: Turnover

P5. Predictors: Average number of employees

P6. Predictors: Duration of activity

If the dependent variable is represented by the importance of retained earnings or sale of assets, using the Stepwise method, only two significant independent variables have been retained, the other variables being excluded. As can be seen in the table above, companies attach greater importance to this category of funding sources when the operational activity was not

particularly affected in terms of financing between March and May 2020, respectively when the company registered a high level of turnover in 2019.

The importance attributed to social capital increases is influenced, in turn, by a higher level of turnover but also by a shorter duration of the company's activity. A shorter business life of the

company also influences the importance of loans from shareholders. The importance given to the following categories of funding sources: loans with a guarantee of credit guarantee funds, leasing and european funds depend only on a higher level of turnover.

The importance given to bank credit is associated with a higher level of turnover but also with a higher maturity of the company.

Also, an association of positive meaning was found between the importance attributed to bank overdraft and credit line and the duration of activity, respectively the size of the company according to the average number of employees. At the same time, it was found that companies with no higher number of employees attach greater importance to factoring.

Companies that are older and considered that access to finance was a pressing problem between March and May 2020 gave greater importance to trade credit and state funding programmes. If, in the case of trade credit, 27,5% of the variance of the dependency variable can be explained by the simultaneous contribution of the predictors, in the case of state funding programmes, this variance is 42.5%.

When younger companies saw the influence of the COVID-19 epidemic on financing needs as an opportunity, they attached greater importance to bond issuance.

As can be seen in the table above, it was not possible to establish a link between the importance attributed to share issues on the capital market, respectively to venture capital funds and the variables under analysis.

## 5 CONCLUSIONS

On the basis of the results of the analyses undertaken, the following conclusions were drawn:

We have found that companies attach greater importance to state funding programmes, respectively less importance to the internal sources of financing the more the

operational activity of the company has been affected in terms of financing. In this context, companies also made greater use of trade credit and state funding programmes, while domestic sources of funding declined in terms of use.

As regards access to finance between March and May 2020, the extent to which it was considered a pressing problem is associated with a higher level of importance attributed to state funding programmes, respectively to a lower degree of importance attributed to domestic sources of funding. At the same time, if access to finance was considered a pressing problem in the period mentioned, the company made a higher use of trade credit and shareholder loans.

If we refer to the period March-May 2020, the turnover recorded in the last year is a factor of positive impact on the degree of importance given to the following types of financing: retained earnings or sale of assets, social capital increase, loans with a guarantee of credit guarantee funds, bank credit, leasing and european funds. The average number of employees has a positive influence on bank overdraft and credit line and factoring. In terms of business life, mature companies are oriented towards bank credit, bank overdraft and credit line, trade credit, state funding programs, while young companies turn their attention to social capital increases, shareholder loans and bond issues. Moreover, the extent to which access to finance has been a pressing problem has led companies to attach greater importance to trade credit and state funding programmes. At the same time, if the operational activity was affected in terms of financing, companies attributed less importance to internal sources of funding. At the same time, the perception of the epidemic's influence on financing needs led to a higher degree of importance for bond issuance between March and May 2020.

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