

## COVID-19, the pandemic of financial systems

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### **Abstract**

*Nowadays, the average companies already have plans regarding their ongoing activities but there is a lack of unknown elements, which concerns them due to COV-19, the pandemic situation. The ordinary emergency plans follow an efficient pattern in case of natural disasters or cyber warfare (already analyzed cases) and the effects are neglected, such as the lockdowns, the endless closer of schools, or the traveling restrictions which are all part of the health scenario. Macro and market risks indicators deteriorated in the context of the COVID-19 outbreak, therefore the strong correlation between the financial sector and the rest of the sectors or the risk of infection that can generate a global systemic crisis should definitely be highlighted. The data used in the research have been tested taking into account the normal distribution of the motionless and then analyzing its effect on the variable. "Financial and insurance activities" were through motion-reply function. However, the regression analysis has been estimated for this variable through the Vector AutoRegression model. Therefore, it has been a clear correlation between the four variables proposed for research and their responses. The response of the variable "Financial and insurance activities" to a possible shock created by the rest of the three variables selected is also significant. The contribution of this research consists in the results obtained regarding the mutual influence of the four variables to which are added a series of measures with major impact that are proposed at the end of the article to be adopted by companies to avoid insolvency and possible systemic risk.*

### **Keywords**

*COVID-19; systemic risk; global; VAR; financial; insurance activities; transportation; storage; construction; accommodation; food; service activities.*

## **Introduction**

Life is 10% of what happens to people and 90% of how people react to what happens to them. People strongly believe that reaction matters a lot, the reaction is a choice, and choice leads to attitude. It is up to the people to choose and understand that well-being cannot be - and never will be - one for all.

Essentially, humans tend to confuse the unknown with the non-existent, and this is leading to risk in all aspects of their lives. When people ask themselves what the risk really is, they try to answer depending on their willingness or reaction (from sports competitions, betting, or simple activities full of hazard, up to isolation due to the fear of various events that may occur).

Similarly, the companies face even more risks than ever and report that they are less prepared than they have ever been.

There are some further examples of the pandemic impact over the four analyzed activity sectors. Thus, in this period when all economic sectors are at a crossroads, financial services are no exception. Despite the potential side effects of COVID-19, the financial sector continues to make bold investment decisions that can greatly influence the growth of banks, asset management firms, and other financial services for years to come. Compared to other business sectors, finance leaders are in a unique position to support the entire economic recovery. The way the financial sector chooses to provide aid in these times can significantly shape the public's perception of this industry.

The transport companies or by their spoken names, logistic companies, those implied in movement, storage, and merchandise were directly affected by the COVID-19 pandemic. Therefore, their part is to supply and help the rest of the companies, and risking damaging this chain of provision would have a great impact on competitiveness, economic growth, or employment.

The impact of the virus on the construction area is definitely pointy on the market area because it includes also architecture and design, equipment manufacturing or transport, and energy segment. The supply companies are mostly affected by this pandemic situation. Not only the material or the labor area but also the costs of the building projects are directly affected and it would cause damage to companies. To understand what is happening, one should consider that the value of the constructions is added by changing the material into a capital asset.

The COVID-19 pandemic had a devastating impact also on tourism. The accommodation and food service activities subsectors have been decimated by the measures taken to stop the pandemic. Most countries have already concluded and are entering a new phase of combating the virus while managing the reopening of this industry and the economy in general.

Basically, there is no "appropriate" behavior in response to risky situations, companies have to be constantly prepared for a wide range of risks that threaten their ability to develop where there is a slowdown in the global economy and an increasingly difficult to understand the international trade conditions due to accelerated changes in market factors.

Given all the circumstances, it seems that a wave of "sadness" has descended on the global business community. However, waiting for this "fog" of uncertainty that has settled from a geopolitical and economic perspective to rise, is not a good perspective. With this in mind, a recent risk analysis must be launched as economic, demographic, and technological forces form a new balance of power. Everyone who chooses to stay out hoping that the entire global system will take a step back will miss crucial opportunities to meet the pressing challenges.

## Literature review

The pressure on the global economy from previous periods, due to macroeconomic fragility and financial inequality continued in the last years, which led to an increased risk of stagnation of the economy, which shows more and more signs of vulnerability.

Therefore, the above statement is significant if certain activity sectors link or spread their incomes widely. For instance, there is a positive connection between the performance in the transport sector and the production growth in the economy. The cost of the logistic as a PIB percentage could rise to 25 for some economies in comparison to 6-8 % in the OCDE countries. Thus, a more efficient path could stimulate competitiveness or economic growth in unexpected markets, and this study clearly presents it (Ian et al., 2020).

All the elements that were considered fundamental for economic growth, such as limiting any trade barriers, fiscal prudence, and strong global investment, are depreciating as world leaders advance nationalist policies. In addition, the margins for monetary and fiscal stimulus instruments are narrower and narrower compared to the 2008-2009 crisis period, which calls into question the functionality of countercyclical policies.

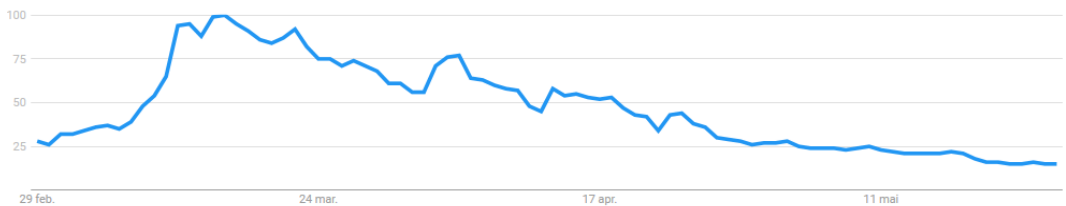
The pandemic crisis has not just highlighted the problems but has also taken out of the way all those artificial actions that have already marked the 2008-2009 economic crises (de Serio & de Serio, 2020). Expectations for the next period foresee a challenging economic climate dominated by "economic confrontations" as well as a "political polarization" within both economic and geopolitical communities. Amid protests around the world and the ability of governments to take decisive action in the event of an economic slowdown has declined considerably, therefore without economic and social stability, countries may not have the financial resources, fiscal space, political capital, or social support to deal with global risks.

As more and more information about COVID-19 appeared, economic markets faced risk aversion, with uncertainty prompting investors to demand an additional risk premium for assets exposed to Chinese demand. The new coronavirus (COVID-19) comes after the US-Iran conflict and could mark a significant risk to the global economy in the next years.

Sharif et al. (2020) said that in the US the impact of COVID-19 on oil prices, the stock market, and geopolitical risk is unprecedented. It is seen differently in the short and long term and can be seen first as an economic crisis. Thus, as the International Labour Organization (2021) was confirming, the construction area had an average of 7.7 % of the labor before the pandemic situation and it was foreseen to rise at 13.4 % from the world's PIB in 2020. However, declining revenues and increasing project delivery challenges have led to the contraction of the sector in most markets, with a negative impact on the workforce.

## Strategica. Shaping the Future of Business and Economy

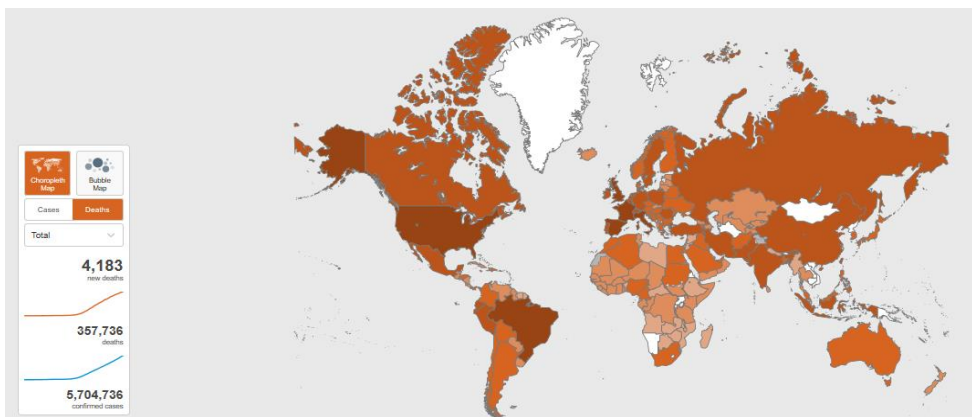
From the first two months of 2020, the virus has been reported in 80 countries with over 95,000 confirmed cases (see map above) becoming a threat that could undermine the gradual recovery of the global economy this year.



**Figure 1. Number of searches on the COVID 19 topic, on Google**  
(<https://trends.google.com/trends/explore?date=today%203-m&q=%2Fm%2F01cpyy>)

Without being a statistical survey, the graph above reflects the search interest in the topic of coronavirus given by people around the world, which is obtained with Google Trends, which uses a sample of Google searches. The number of results on a given topic is relative to a scale from 0 to 100, depending on the proportion of the subject to all searches, on all topics. We notice that the peak was reached in the first part of March when both economic and social life "stopped" oscillating from panic and conspiracy to denial/ignorance. We cannot help but notice the descending slope of the graph, which makes us think only of a gradual return.

On the map below, you can see figures that show nothing but the gravity of the current situation.



**Figure 2. Spread of the COVID-19 cases**  
(<https://covid19.who.int/>)

Almost all the nations are struggling to slow down the transmission of the disease by testing and treating patients, quarantining suspected persons through contact tracing,

restricting large gatherings, maintaining complete or partial lockdown (Chakraborty & Maity, 2020).

Increases in economic costs could be significantly avoided in the next period with increased investment in public health systems in all economies, especially in economies where health systems are less developed and population density is high (McKibbin & Roshen, 2020). In the situation where "uncertainty is becoming the new normal", we need to look at what we know about the new threat to COVID-19 and what we can do to prevent systemic risk and worse a global crisis. So far, we know that the virus is spreading rapidly. A large number of those directly affected, and their spread denotes the idea that a global problem is being faced and requires a global response.

Experience so far reminds people that about a third of the economic losses caused by the disease will be direct costs such as loss of life, job closure, and quarantine. The difference of two-thirds will represent indirect costs, reflecting a decline in consumer confidence coupled with a tightening of financial markets. These will be particularly challenging, especially for countries with weaker health systems and fragile response capacities. That is why a global coordination mechanism is needed, for accelerating the recovery of supply and demand.

It is shown that the COVID-19 pandemic fuels the foreign direct investment outflows in the economies due to a short supply of manpower caused by the social distancing policy of governments, a reduction in financial resources of firms resulting from a decline in corporate profits, and an increase in the cost of finance in the financial market (Ajide & Osinubi, 2020).

The above situation is evolving rapidly and everything must be prepared for sending a stronger and more coordinated response if conditions require it. First, it is necessary to cover health expenses of the highest rank for the protection of human well-being, taking care of sick people, and slowing down the spread of the virus. The importance of ensuring the production of medical materials is emphasized in this respect, so that supply is in line with demand. Secondly, macro-financial actions may be needed to deal with the supply and demand shocks described above. Thirdly, adequate liquidity in the economic system will be needed to offset the risks of financial stability.

The longer this health crisis lasts, the more the financial sector will suffer. Practically, its financing by investors, enterprises, and consumers will be limited, thus reducing the level of consumption of financial services. Now, banks are facing a difficult situation in terms of yields because interest rates have remained at a very low level and close competition comes from alternative and emerging platforms. Banks need to rethink their entire long-term growth strategy. In addition, the entire financial sector must anticipate and manage the deterioration of the credit quality of customers, which will probably lead to more precaution on the part of consumers regarding loans for major purchases, namely houses and cars. Money to support recovery has never been cheaper. Most governments have chosen to step in to provide financial assistance. For

example, the US Federal Reserve has launched a \$700 billion incentive package to support the economic recovery and has promised to keep interest rates low until 2023. Some capital and liquidity requirements have also been relaxed to help speed up lending by banks (Tracee, 2021)

So far, the analysis of existing global financial results leads us to a conclusion that fiscal policy is more effective in mitigating the effect of the COVID-19 pandemic than monetary policy decisions, especially since the adoption of accommodative monetary policies by many central banks can lead to inflationary pressures that could worsen short-term macroeconomic stability (Ozili & Arun, 2020)

Lockdown measures to isolate the virus have had a severe impact on accommodation and food services activities globally. Using only figures from G20 countries, the hospitality and travel sectors account for an average of 10% of employment. A sudden cessation of activity, as has happened since March 2020, would directly reduce GDP by 2½ to 3½ percent. Countries that depend largely on these sectors should expect a much sharper decline. This type of shock would circulate through the production chain and can generate a significant impact on other sectors of the economy, special the services sector (Margaux et al., 2020)

Sailan and Rongrong (2021) set out to investigate in their study the side effects of the US economic review, as a result of the COVID-19 pandemic, on economic growth and energy consumption in other countries, using a global autoregressive vector approach (GVAR). The results of the simulation indicate that the US recession has a negative impact on the economic growth of other countries through their existing trade relations, especially for countries that have a close trade relationship with the USA.

The study undertaken by Feldkircher et al. (2021), also for the US area, raises questions about the measures adopted by the US Federal Reserve (FED). Were they effective in stimulating real activity and calming financial markets? To measure these effects at high frequencies, the authors used a mixed frequency autoregressive vector model (MF-VAR). Following the study, the results show that the monetary expansion caused higher output and stock market returns, more favorable long-term financing conditions, and a depreciation of the US dollar compared with a no-policy benchmark scenario.

Also using the autoregressive vector (VAR) technique and the Granger method, Babarinde (2020) studied the impact of the COVID-19 pandemic on stock market indicators. Empirical findings do not suggest any evidence of causality between coronavirus and stock prices in Nigeria but we must keep in mind that this study was conducted in an area characterized by certain economic and social features.

Many existing companies have not yet been able to implement the approaches and put in place the tools that could help them to systematically identify and assess the risks they face based on the mitigation strategies and measures they have developed lately.

The situation that companies are facing these days is highly complex, with challenges set to intensify in the coming period as new risks become even more prominent, including the implications of an aging workforce, the impact of climate change, and increasingly frequent cyber-attacks.

## Methodology and data

Based on the specialized literature, I wanted to observe the relationship between four economic sectors at the national level in the case of Romania. The hypothesis from which we started in approaching this study was that there is a strong interconnection between the four sectors and the imbalance of the first will inevitably lead to affecting the other three. The reason why we used the autoregressive vector (VAR), as well as the application method, are given below.

### *Vector Autoregression (VAR) - model definition*

The VAR model allows the symmetric treatment of all variables in the model, in the sense that it does not imply the exogeneity of a certain variable. In addition, it is desirable to use it when we are not sure that a certain variable is exogenous. In the case of a VAR model with two variables, we will allow the evolution of the variable  $x$  to be influenced by previous values (lags) of  $x$ , as well as by current and previous values of  $y$ . We will also assume that  $y$  is influenced by its lags, as well as by current or previous values of  $x$ .

Therefore, the simple bivariate system either (the structural form of the system or the initial form):

$$x_t = a_{11} + a_{12}x_{t-1} + a_{13}y_t + a_{14}y_{t-1} + \varepsilon_{xt} \quad (1)$$

$$y_t = a_{21} + a_{22}y_{t-1} + a_{23}x_t + a_{24}x_{t-1} + \varepsilon_{yt} \quad (2)$$

Where both  $x$  and  $y$  are assumed to be stationary variables, and  $\varepsilon_{xt}$  and  $\varepsilon_{yt}$  are white and uncorrelated noises (essential conditions for the correct writing of a VAR in general). For example,  $a_{13}$  quantifies the contemporary (direct) impact of a unit change of  $y_t$  on  $x_t$ . Moreover, if  $a_{23}$  is nonzero, then  $\varepsilon_{xt}$  has a contemporary indirect impact on  $y_t$ ; if  $a_{13}$  is nonzero, then  $\varepsilon_{yt}$  has an indirect contemporary impact on  $x_t$ .

The above two equations constitute a first-order VAR system since the length of the lag is a period. Given the way the system is written, it incorporates feedback - mutual influence between  $x$  and  $y$  is allowed. The above equations are not in reduced form since the simultaneous impact of one variable on another variable is allowed (the reduced form is necessary for the practical implementation of such a system). Using the matrix, the system can be rewritten as follows:

$$\begin{bmatrix} 1 & -a_{13} \\ -a_{23} & 1 \end{bmatrix} \begin{bmatrix} x_t \\ y_t \end{bmatrix} = \begin{bmatrix} a_{11} \\ a_{21} \end{bmatrix} + \begin{bmatrix} a_{12} & a_{14} \\ a_{24} & a_{22} \end{bmatrix} \begin{bmatrix} x_{t-1} \\ y_{t-1} \end{bmatrix} + \begin{bmatrix} \varepsilon_{xt} \\ \varepsilon_{zt} \end{bmatrix} \quad (3)$$

Alternatively:

$$B \cdot z_t = \Gamma_0 + \Gamma_1 \cdot z_{t-1} + \varepsilon_t \quad (4)$$

Where:

$$\begin{bmatrix} 1 & -a_{13} \\ -a_{23} & 1 \end{bmatrix} = B, \quad \begin{bmatrix} x_t \\ y_t \end{bmatrix} = z_t, \quad (5)$$

$$\Gamma_0 = \begin{bmatrix} a_{11} \\ a_{21} \end{bmatrix}, \quad \Gamma_1 = \begin{bmatrix} a_{12} & a_{14} \\ a_{24} & a_{22} \end{bmatrix}, \quad \varepsilon_t = \begin{bmatrix} \varepsilon_{xt} \\ \varepsilon_{zt} \end{bmatrix} \quad (6)$$

Multiply by  $B^{-1}$  allows the standard form of VAR to be obtained:

$$z_t = A_0 + A_1 \cdot z_{t-1} + e_t \quad (7)$$

The new system is written as follows (and is called VAR in standard form):

$$x_t = a_{10} + a_{11}x_{t-1} + a_{12}y_{t-1} + e_{1t} \quad (8)$$

$$y_t = a_{20} + a_{21}x_{t-1} + a_{22}y_{t-1} + e_{2t} \quad (9)$$

Because both  $\varepsilon_{xt}$  and  $\varepsilon_{zt}$  are white noises, it follows that  $e_{1t}$  and  $e_{2t}$  have zero mean, constant variance, and are not individually correlated taken individually. Consequently, these are stationary processes, but it should be noted that they can be serially correlated with each other (in general, their covariance is non-zero). Shocks are uncorrelated only if there is no simultaneous impact between system variables.

Among the advantages of VAR models:

- does not require clear separation of endogenous and exogenous variables;
- can be used to deduce how economic variables respond to shocks;
- are widely used in macroeconomic modeling, being included in most econometric programs

However, VAR models do not lack disadvantages:

- Often criticized for lack of theoretical foundations;
- Presupposing the existence of some interactions contemporary between variables (structural models) requires imposing additional restrictions to be identifiable;



- Interpretation of the results depends decisively on how were imposed these restrictions.

### ***Dickey-Fuller Test***

Tests the null hypothesis that a unit root is present in an autoregressive model. The alternative hypothesis is different depending on which version of the test is used but is usually stationary or trend-stationary. The Dickey-Fuller test starts from the hypothesis that a stochastic white noise process generates errors. In reality, the errors can be autocorrelated and/or hetero heteroskedastic. The ADF test (Augmented Dickey-Fuller, Dickey & Fuller, 1981) is constructed in such a way as to eliminate the possible autocorrelation of errors by introducing delayed variables (lag).

### ***Jarque-BeraTest***

To estimate the error distribution, the Jarque-Bera test uses the residual moments calculated based on the least-squares method. The null hypothesis of the Jarque-Bera test is  $H_0$ : the errors are normally distributed and are evaluated against the alternative hypothesis  $H_1$ : the errors follow another distribution from the Pearson-type distribution family (or the A-type Gram-Charlier distribution family). In applying Jarque-BeraTest it must be taken into account that tests of this type are asymptotic so that the interpretation of the results only makes sense for large sample sizes.

### ***Impulse-response functions***

The high number of coefficients in a VAR model makes it relatively difficult to interpret the relationships that exist between variables starting from these coefficients. Instead of analyzing each coefficient in each equation, one can analyze a synthetic picture of the dynamic behavior of the VAR model. This image is given by the impulse response functions, which describe (in tabular or graphical form) how each variable reacts to its shock or a shock in the other variables. A shock occurring within the equation of the variable  $i$  not only directly affects the variables  $i$ , but is also transmitted to all other endogenous variables through the dynamic structure of the VAR model. An impulse response function tracks the effect of a shock at one point in one of the model's innovations on present and future values of endogenous variables.

### ***Data sources and variables descriptions***

The variables that are included in the model are based on economic theory (although the VAR allows the inclusion of variables without a certain a priori connection).

Our variables are:

- Financial and insurance activities;
- Transportation and storage;
- Construction;
- Accommodation and food service activities.

The variables represent figures (Market capitalization) taken from the Romanian stock market (Bucharest Stock Exchange/ Monthly Bulletin) and reflect the situation for the period 2016-2020 (April). The data have a monthly frequency.

**Table 1. Descriptive statistics**

	FINANCIAL	TRANSPORTATION	CONSTRUCTION	ACCOMODATION
<b>Mean</b>	2.526957	2.232110	1.954059	1.934247
<b>Median</b>	2.532338	2.234987	1.953182	1.932352
<b>Maximum</b>	2.550430	2.262880	1.990843	1.959704
<b>Minimum</b>	2.488291	2.200939	1.926314	1.918327
<b>Std. Dev.</b>	0.160148	0.143137	0.168807	0.088506

*Note: Financial and insurance activities (FINANCIAL); Transportation and storage (TRANSPORTATION); Construction (CONSTRUCTION); Accommodation and food service activities (ACCOMODATION)*

*Source: Authors' research*

**Mean** is the average of the data series, obtained by summing all values and division by the number of observations.

**Median** is the median of the data series, defined as the value in the middle of the series when its values are ordered in ascending order. The median is a robust measure of the "central trend", being less sensitive to aberrant values than the average.

**Max** and **Min** represent the maximum and minimum values recorded as standard for the current sample, respectively.

**Std. Dev.** (Standard deviation) represents the standard deviation, which is a measure of the dispersion or "scattering" of the series values from the mean.

In Table 1 we observe that the mean reveals that are positive ranging from 1.93 to 2.52 over the period under consideration. The standard deviation shows how far observations are from the sample average. The highest value is recorded by Construction but also this one is not a value that can affect our model.

**Table 2. Descriptive statistics**

	FINANCIAL	CONSTRUCTION	ACCOMODATION	TRANSPORTATION
<b>FINANCIAL</b>	1	0,4104	0,2100	0,8180
<b>CONSTRUCTION</b>	0,4104	1	0,6923	0,1696
<b>ACCOMODATION</b>	0,2100	0,6923	1	0,1432
<b>TRANSPORTATION</b>	0,8180	0,1696	0,1432	1

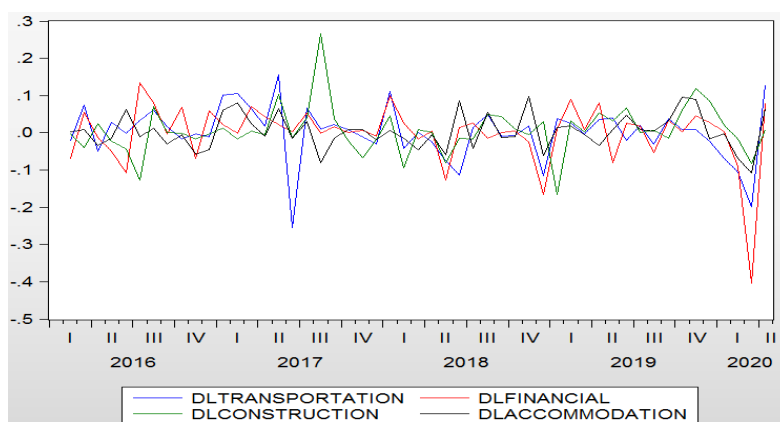
*Note: Financial and insurance activities (FINANCIAL); Transportation and storage (TRANSPORTATION); Construction (CONSTRUCTION); Accommodation and food service activities (ACCOMODATION)*

*Source: Authors' own research*

Table 2 shows the pairwise correlation between the variables. We observe that the strong correlation is between FINANCIAL sector and TRANSPORTATION sector and the lowest is registered between ACCOMODATION and TRANSPORTATION

## Empirical results

It is being examined how the above variables influence each other in conditions of contagion possibility and as part of the economic system. It is also carried out this research to see the correlation of the economic sectors in the conditions in which the situation may deteriorate during this period due to the COIVD-19 pandemic (we will draw these conclusions at the end of the paper).



**Figure 3. Distribution of data series**  
(Authors' research)

First, it is necessary to apply some mathematics operations on the data series for a good interpretation of the coefficients that we will achieve. It was applied the logarithmic process as well as the first difference then we test the stationarity of the data series. In graph 1, it can be seen the distribution of the data series.

Augmented Dickey-Fuller Test Equation was applied on all variables and it turned out that they are stationary. The critical values for each relevance level (1, 5, and 10 percent) and the probability,  $p$ , associated with the test result were the basis for determining the stationarity.

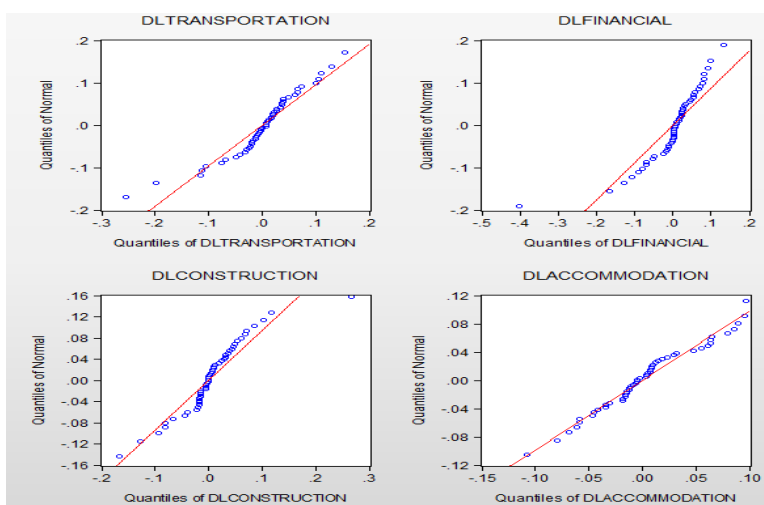
We give below for example only the values for *financial and insurance activities*:

Null Hypothesis: D(DLFINANCIAL) has a unit root		
Exogenous: Constant		
Lag Length: 5 (Automatic - based on SIC, maxlag=10)		
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.721148	0.0000
Test critical values: 1% level	-3.588509	
5% level	-2.929734	
10% level	-2.603064	

**Figure 4. Values for Augmented Dickey-Fuller Test - Financial and insurance activities**  
(Authors' research)

As the value of the test is lower than the critical value for any of the relevance levels, choosing the most restrictive relevance level, 1 percent, it can be said that at 1 percent relevance level, the null hypothesis (the series is non-stationary) is rejected. This result is also indicated by the value of the associated probability,  $p$ . Thus, it is lower than the most restrictive level of relevance, of 1 percent and as a result, the null hypothesis - the series is non-stationary - is rejected.

The graphs of the theoretical (normal) distribution versus the quantiles of the distribution being analyzed are plotted below. Thus, the quantiles of the normal distribution are represented with a solid line, and with dots those of the effective distribution. The more the points deviate from the line, the distribution is not normally distributed.



**Figure 5. Normal distribution of data series**  
(Authors' research)

In addition, to test the type of distribution we also applied the Jarque-Bera test. In our case, the probability associated with the test is higher than the chosen relevance level (1, 5, or 10 percent), then the null hypothesis is accepted. The residue testing step of the equations is very important because the same assumptions of stability and stationarity must be observed. Failure to do so may lead to erroneous conclusions about, for example, the standard error, and the conclusions drawn may be false. The model meets all the criteria necessary for validation.

The VAR model can be written and allows the study of the impact of a shock on the evolution of the dependent variable. The model equation for *financial and insurance activities* (the indicator of most interest at the moment, representing the non-banking financial system) is represented as follows:

**Table 3. Equation form**

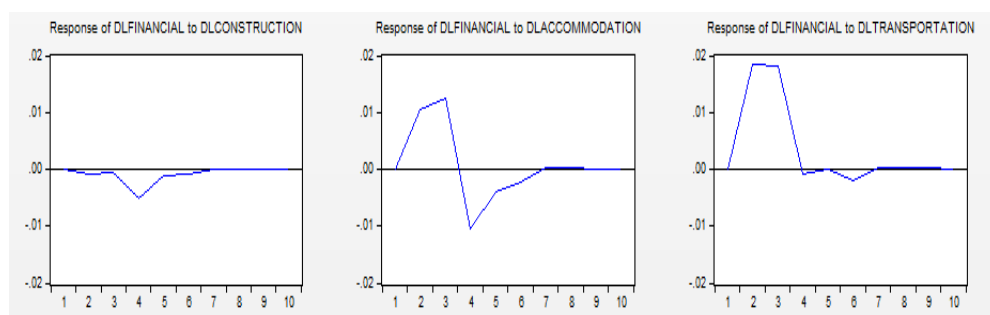
<b>Equation</b>	$L\_FINANCIAL = C(19)*L\_ACCOMMODATION(-1) + C(20)*L\_ACCOMMODATION(-2) + C(21)*L\_CONSTRUCTION(-1) + C(22)*L\_CONSTRUCTION(-2) + C(23)*L\_FINANCIAL(-1) + C(24)*L\_FINANCIAL(-2) + C(25)*L\_TRANSPORTATION(-1) + C(26)*L\_TRANSPORTATION(-2) + C(27)$ <p>Where:  <math>C(19): 0,129557; C(20): -0,285318; C(21): -0,003091;</math>  <math>C(22): -0,011764; C(23): 0,557559; C(24): -0,039134;</math>  <math>C(25): 0,201283; C(26): 0,281038; C(27): 4,705671.</math></p>
<b>Observations: 50</b>	
<b>R-squared</b>	0.801979
<b>Adjusted R-squared</b>	0.763340
<b>S.E. of regression</b>	0.075758
<b>Durbin-Watson stat</b>	2,01586

Note: Financial and insurance activities (FINANCIAL); Transportation and storage (TRANSPORTATION); Construction (CONSTRUCTION); Accommodation and food service activities (ACCOMMODATION)

Source: Authors' research

Note that the value of R-squared is close enough to 1 which is good because it is practically measured the "success" with which the estimated regression equation manages to explain the value of the dependent variable in the sample. Normally, this statistic can be interpreted as the fraction of the variance of the dependent variable explained by the independent variables. The statistic is equal to 1 if the regression equation fits perfectly and zero if it does not fit better than the average of the dependent variable. As well, for this equation we will observe the Durbin-Watson value, 2,015, which is in the range of 1.5 to 2.5, thereby are relatively normal, we accept the null hypotheses according to which there is no first-order autocorrelation.

The graphical view is presented below and the response of each variable to the others can be identified.



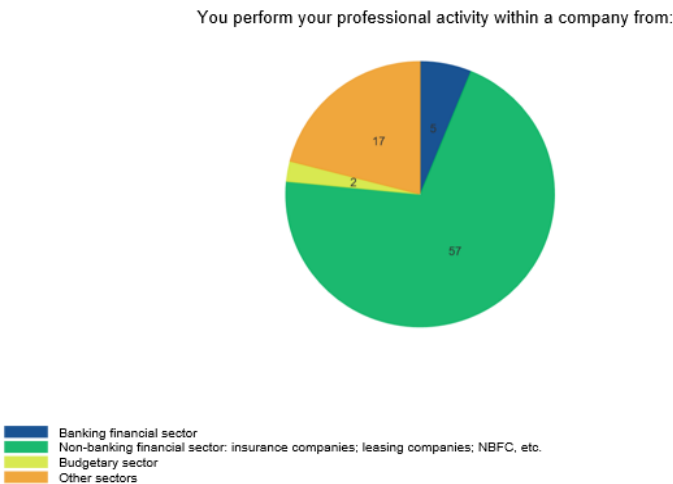
**Figure 6. Impulse-response functions: Financial to Accommodation and Transportation**  
(Authors' research)

The connection that the financial field has with the other three studied fields is presented in the image next to the three graphs in Figure 6. As can be seen, the strongest connection exists with the field of transport, this correlation being the effect of an insurance market dominated by MTPL policies. We can't resume only at these two connections of the financial market because these days, primarily due to the COVID-19 pandemic, we saw this sector strongly affected. Given the above, we considered it opportune to conclude the article subject identifying the main risks perceived at the level of the Romanian market by the people actually involved in the financial field.

We bring this issue into question because non-banking financial systems (which we also emphasized in the model presented above) have proven that they cannot cause a higher systemic risk compared to banking institutions, but they unequivocally influence the rest of the business sectors.

We wanted to include the following statistics in this study to continue to have starting points in future research and to sound the alarm in terms of awareness and spread of risk in the financial market. We developed 17 questions, starting from the structure of the survey conducted by AON and I posted them on an online platform (iSondaje.ro) to be sent to the financial market and not only for data collection. We will reproduce the results of the survey in this paper only partially, using only those that come to better explain the topic of this research.

81 respondents participated in this study, grouped by activity sectors as shown in Figure 7 below.

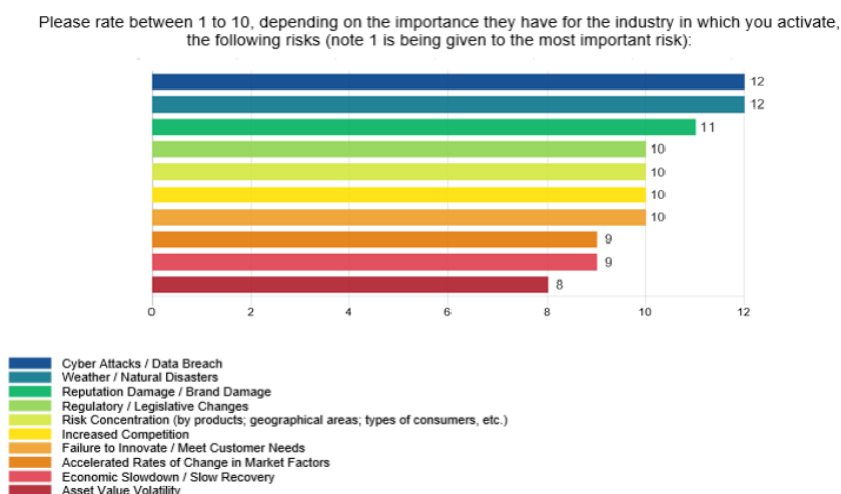


**Figure 7. Dividing the respondents according to the sector in which they operate**  
(Authors' research)

The largest share is held by respondents from the non-banking financial sector, representing 57% of all respondents. Thus, the study undertaken fulfilled the first objective, namely to be dedicated to people with a certain level of knowledge in the financial field (non-banking).

The financial system ensures the appropriation, investment, or distribution of money between sectors of the economy. These financial circuits generate benefits, but also potential risks associated with financial intermediation, for economic agents, and the population.

Next, we asked respondents to classify the top 10 risks with the greatest impact and we obtained the following classification according to the importance given:



**Figure 8. Classification of risks with systemic impact by respondents**  
(Authors' research)

The first place is occupied by two risks that have accumulated the same score, namely "Cyber-attacks / data security" and "Natural disasters". One justification would be that indeed in the context of economic and geopolitical changes they both come to complement the "picture" of global risks and climate change, which are becoming more pronounced and quicker than many of us expected. The last five years are about to be the warmest and natural disasters are becoming more intense and frequent. Alarmingly, global temperatures are about to rise by at least 3 degrees Celsius by the end of the century, which would double the increase estimated by climate experts. With this level, we will have very severe economic, social and environmental implications. Climate change has become a global concern with both short-term and long-term risks, with "biodiversity loss" ranking second in terms of impact among the risks of the next decade with critical implications for humanity starting with the collapse of food and health systems until the supply chain is cut off.

There are not far from the top of the rankings in this period, not even the cyber risks. Considering more than 50% of the world's population is now online, about one million people go online for the first time every day, and two-thirds of the global population owns a mobile device. While digital technology brings significant economic and social benefits to the majority of the global population, issues such as unequal internet access, a lack of global technology governance framework, and cyber insecurity are all significant risks. Geopolitical and economic uncertainty, including the possibility of secure cyberspace, significantly threatens the realization of the full potential of next-generation technologies.

The study presented above was undertaken before the pandemic crisis made its mark. Thus, we are now trying to have an updated vision of reality, and analyzing the latest available reports we notice that the pandemic risk is part of the top 3 business risks (Allianz, 2021).

The risks identified above may be supplemented during this period with the following risks:

*1. Employee illness*

If a small number of employees get sick, the rest of the colleagues can take over their tasks, but if the number of infestations is consistent, the situation can become critical leading to the operation of the company in a state of "damage" or even will cease activity.

*2. Impossibility of suppliers to deliver*

We live in a world where supply chains are interconnected, and their disruption can lead to the cessation of production/activity of many companies. To better understand, we only need to look at how many businesses have temporarily or completely closed their gates, starting with the big car manufacturers and even small entrepreneurs.

*3. The disappearance of commercial activity*

It has been and not infrequently the case where the delivery/sale of products has become impossible (for example when certain areas were included in quarantine).

Many other risks can be derived from these three risks, which are stated in general terms and for illustrative purposes only. What is important is the awareness of companies that things can take a serious turn very quickly and the loss of money can only be the easy part of things.

To sum up, an analysis of each sector is done.

Regarding the transport sector, all the operative restrains would lead to a delay of the purchase or overcrowdings and even higher prices. However, there are companies, which are not so affected in comparison to others, such as those in the electronic sector with increased activity due to the online purchase of the customers whereas the other sectors fall apart. Thus, the smaller companies will definitely lose because they do not have a backup plan or at least something to hold on to. The lack of technology or health tools forbids them to function further. On the other hand, the top players launched the so-called Major Force clause – that kind of clause that allows invalid agreements to be



declared – for instance, Cov-19. Nonetheless, there is to be mentioned that the fuel prices should decrease to ease the transport sector. The uncertainty would hustle the incomes.

The construction sector will play an essential part in the world's economy once with the health crisis. The post-pandemic period could place this sector on a higher rank and also could lead to a strong industry or even well-paid jobs.

The recovery of the accommodation and food service activities will depend crucially on the recovery of the other industries in the same local authority. Particular importance has high-productivity, high-wage industries that trade goods and services internationally.

The global response to the pandemic has highlighted new approaches that financial institutions should take into account as much as possible, including personalized digital tools and other innovations that meet the needs of stakeholders. It also becomes increasingly clear that the entire financial system needs to adapt its products and processes to the different risks and needs of consumers.

## Conclusion

We thus demonstrated in the study that there is a major impact of the COVID 19 pandemic in the economic field, and not only, drawing attention to the interconnection between the four sectors included in the model.

We will finally conclude by trying in the following to outline a series of measures that can be adopted both before and after the crisis effects begin to manifest:

- Because the first risk listed above referred to the illness of employees, there is the option in which companies can conclude a private health insurance policy for employees to cover the risk of illness with Covid-19. The Romanian insurance market benefits from such a health product offered by one of the top insurers locally and not only. Such a measure would certainly generate increased trust on the part of employees towards the company;
- The potential loss of profit due to the impossibility of accessing the company's site/location can be covered by a special clause. However, it usually only covers unrealized profit losses or additional operating expenses if the authorities prohibit access to the location affected by a risk covered by the property policy. Fortunately, it is not mandatory to have material damage to have a claim using this clause. Certain wording may also cover situations similar to Covid-19 infestation;
- Ensuring a business continuity plan:
- Finding alternative suppliers and concluding pre-contracts with them;
- Moving correspondence (email), files, and applications in the cloud, in case employees will have to work remotely;
- Establishing critical business processes and preparing relocation plans and resources needed to restore any critical processes;

- Concentrating only on the activity that brings the highest value;
- Review of force majeure clauses in contracts - in case they can no longer provide services and products in order not to pay penalties to customers if the products, services cannot be provided;
- Educate employees and take necessary measures to protect against potential Covid-19 infection;
- Finally, it is at least important to review the communication plan (internal/external) in case of a crisis to adapt it to a pandemic.

The measures specified above are pointed out to ensure the lowest possible contagion given the interconnection of economic sectors.

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