

# The Influence of Covid-19 Pandemy on Financial Fraud Risk Assessment

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## Abstract

*In today's economic environment, the many harms caused by financial fraud have attracted increased attention from academia and regulatory bodies alike. In the last two decades, marked by great crises, pandemics, financial fraud has affected to the global economy, being a threat for stability of the capital markets. The purpose of this study is to highlight the main aspects of the specialized literature on the subject of fraud risk, for its analysis and assessment. This study aims to obtain a financial profile of entities at risk of being subject to financial reporting fraud or asset misappropriation. The sample is represented by the entities listed on the BSE regulated market in the period 2020-2022. According to the object of activity, the analyzed entities are grouped as follows: chemical-pharmaceutical, tourism and services. In the study it is proposed the option of analyzing and assessment of fraud risk using quantitative and qualitative methods.*

**Key words:** financial audit, risk of fraud, determined factors, the Covid-19 pandemic, BVB

**J.E.L. clasification:** C38, C58, M41, M42

## 1. Introduction

Economic globalisation entails increasingly common scandals in entities, which in turn have led financial auditors to pay much greater attention to detecting financial fraud and manipulating results before these entities suffer significant losses (Agubata, 2021, p. 41). Moreover, in recent years, financial fraud scandals of listed entities have occurred frequently, which has attracted a great deal of attention from regulatory bodies (Amiram *et al.*, 2018, p. 1).

*Association of Certified Fraud Examiners* (ACFE), in its 2022 report, which presents the analysis of 2,110 fraud cases committed worldwide, estimates that on average, at the level of an entity, the losses generated by such an act are about 5% of total annual revenue, in 79% of cases individual losses below \$ 200,000 are highlighted, and approximately 21% of defrauded entities experience losses of more than \$1,000,000 on average (ACFE, 2022, p. 8). In addition, several studies related to financial fraud have also highlighted how fraudulent activities have affected businesses and economies globally over the years (Andoh *et al.*, 2018; Asmah *et al.*, 2019; Zahari *et al.*, 2020).

The unfortunate reality is that the number of fraud cases continues to increase, posing more threats to entities and economies (Owusu *et al.*, 2021, p. 428). Lately, fraud cases recorded globally have increased by about 12% (ACFE, 2022, p. 9). The increase in reported fraud cases, in part, may explain the increase in research interest in fraud lately.

An essential factor in fraud prevention is the entity's environment itself, characterized by a certain organizational culture, a series of activities and attitudes towards the inherence of fraud risk (Robu, 2014, p. 88). A primary role in fraud detection belongs to the financial auditor, that professional whose independent and objective opinion guarantees the accuracy of financial statements (Robu, 2014, p. 128).

ISA 240 clearly states whose primary responsibility for fraud prevention and detection is: "The primary responsibility for fraud prevention and detection lies with both those charged with the governance of the entity and management." It also states that "An auditor conducting an audit in accordance with ISA is responsible for obtaining reasonable assurance that the financial statements, taken as a whole, are free from material misstatements, whether as a result of fraud or error (IFAC, 2021, p. 104).

The purpose of this study is, on the one hand, to review the main aspects of the specialized literature on the topic of fraud risk, and on the other hand, to obtain a financial profile of entities at risk of fraud during the period before and after the COVID-19 pandemic.

## 2. Literature review and hypothesis development

Currently, businesses face a global environment characterized by market uncertainty, doubts about the consequences of new regulations, globalization and innovation. Life and the economic environment have become increasingly complex, even if certain activities have become more practical due to new information technologies. In this context, and despite regulatory constraints requiring management to assess the risks associated with fraud, the numerous cases studied worldwide in recent years, which have been widely publicized, have realized the importance of fraud risk management, which will affect not only the entity's financial resources but also its image (Daoui & Maskini, 2021, p. 90).

In the specialized literature, fraud is seen as an illegal act, which aims at deliberately deceiving, voluntarily appropriating financial benefits, respectively intentionally falsifying documents, which can result in significant damage to a person or entity (Le Maux *et al.*, 2012, pp.74-75).

In the literature, fraud has made significant progress in its definition. Many of these definitions have informative keywords or terminology in common. For example: fraud is an act "intentional", "deliberate", "intentional action", "omission", "misrepresentation", "disguise", "deceive", "mislead stakeholders" and "deceive entity managers, regulators and stakeholders" (Rezaee, 2005; Apostolou *et al.*, 2000; Ozkul & Pamukcu, 2012; Ozili, 2015). All of these keywords have primarily been used to describe fraud that is an attempt by one or more individuals, employees, and managers to obtain financial benefits that would not be obtained without such actions (Zahra *et al.*, 2005; Ozili, 2015).

As defined by Black's Law Dictionary, fraud refers to a misknowledge of the truth or concealment of a material fact in order to cause another to act to its detriment (Zhu *et al.*, 2021, p. 1).

Association of Certified Fraud Examiners (ACFE) distinguishes three types of financial fraud, namely: fraud in financial reporting (fraudulent statement), asset misappropriation and corruption (Alqatan *et al.*, 2020, p. 218).

Fraudulent reporting consists of voluntary misstatements in statements, both financial and non-financial, reported by the entity with the aim of misleading users of financial statements (ACFE, 2020, p. 1.202). Fraud on financial statements almost always involves either overstating assets, income and profits or understating liabilities, expenses and losses as appropriate (ACFE, 2020, p. 1.203). Regarding the theft of assets, we can list frauds committed on cash or other treasury equivalents, as well as fraud on stocks or goods of the nature of inventory objects, by their illegal appropriation (IFAC, 2018, p.181).

The third largest category of fraud, which takes the form of corruption, includes conflicts of interest, bribery, illegal gratuities and economic extortion (Mironiuc *et al.*, 2012, p. 3). However, both ISA and SAS auditing standards recognize only the first two forms of fraud impacting audit risk, namely: fraudulent reporting and misappropriation of assets (Mironiuc & Robu, 2011, p. 23).

Among the main actors involved and responsible for these phenomena are: entities, external controllers (from external auditors, certified accountants to state control bodies, by deviating from the code of ethics and deontological standards) and banks (Robu *et al.*, 2012, p. 3).

Empirically, several studies (Abdullahi & Mansor, 2015; Manurung & Hadian, 2013; Huber, 2017) have often used the *Fraud Triangle* to explain the reason behind fraudulent activities by individuals against entities.

Regarding the determinants of financial fraud, Steve Albrecht identifies the following: an extravagant lifestyle, irresistible desire for personal gain, high indebtedness, close agreements with clients, poor remuneration in relation to assigned responsibilities, wasteful attitude, desire to defeat the system, family and social pressures (Albrecht *et al.*, 2018, pp. 95-103; Daoui *et al.*, 2021, p. 91).

From the perspective of ISA 240, the factors determining the emergence of fraud risk, associated with misstatements resulting from fraudulent financial reporting, are mainly influenced by certain management characteristics and internal control environment, sector-specific conditions (economic and regulatory environment in which the audited entity operates) and certain operational characteristics (Jaba *et al.*, 2012, p. 15).

Among the most famous researchers in the field of financial fraud is Donald Cressey (1919 - 1987). He argues that the determinants of financial fraud could be synthesized in a fraud triangle (later assumed by ISA 240), in which each angle is represented by the motivation for committing the fraud (Mironiuc & Robu, 2012, p. 180).

Donald Cressey's approach to the drivers of fraud resulted from a study of 200 people convicted of various financial crimes. In *Other People's Pressure Opportunity Rationalization Money* (1953), Donald Cressey proposes a synthesis of the determinants of financial fraud in three dimensions, in the form of *Fraud Triangle*, as follows:

Figure no. 1. Fraud triangle proposed by Donald Cressey



Source: Adapted from (Cressey, 1953)

As can be seen from the figure above, there are three main categories of factors underlying the occurrence of fraud, these being pressures, opportunities and reasoning. First, fraud involves pressures that can manifest themselves on one or more persons, respectively on the entity. These can be classified into categories such as: financial pressures, management pressures, others (Albrecht *et al.*, 2018, p. 35).

As far as opportunities are concerned, there are a number of factors that generate them and which result in fraud, these can be summarized as follows: deficiencies of the internal control system related to the prevention and detection of illicit acts; the absence of an adequate system for evaluating the performance of the entity's employees; lack or inefficient application of a regulatory framework to hold accountable persons who commit fraud; access to confidential information; vulnerability, ignorance and inability of entities or management to prevent fraud; the absence of a traceability system for high-risk financial operations (Robu, 2014, p. 84).

*Rationalization* is the third element of fraud triangle theory. This concept indicates that in the process of committing fraud, a fraudster must convey different types of morally acceptable behaviors that will be used to rationalize his idea before violating trust (Abdullahi *et al.*, 2018, p. 4).

Although the *Fraud Triangle Theory* has existed in the literature for a long time, it remains a solid basis for modern ways of investigating and examining financial fraud (Albrecht *et al.*, 2018, pp. 257-268). The importance of this theory in explaining the phenomenon of financial fraud has been highlighted in numerous studies (Albrecht *et al.*, 2018, p. 35; Lister, 2007, pp. 61-66; Murdock, 2008, pp. 1-14; Rae & Subramaniam, 2008, pp. 1-43). All of these studies provide empirical evidence that individuals commit financial fraud due to the pressures they face, the existence of the opportunity for financial fraud, and their ability to rationalize their actions (Owusu *et al.*, 2021, p. 433). Sujeewa *et al.*, (2018) conclude that the Fraud Triangle still remains a classic model for the professional offender.

Recent studies in the field of financial fraud highlight that the use of financial ratios may signal the emergence of fraud risk within the entity (Robu, 2012, p. 17). In addition, some studies support the idea that the occurrence of fraud (in its two forms: asset theft and fraudulent financial reporting) are conditioned by the entity's financial position and performance (Mironiuc *et al.*, 2011, pp. 1-13). Moreover, some researches nuance the idea that, at entity level, the degree of indebtedness, respectively the object of activity have a great influence on the occurrence over time of fraud risk (Jaba *et al.*, 2011, pp. 220-233). Also in this respect, some specialized studies support the premise that statistical methods are essential in the fraud risk assessment process, useful at the same time to any financial auditor. Based on the above, the following working hypotheses are proposed for testing and validation:

- H1:** *The fraud determinants represented by pressures, opportunities and reasoning synthesized in the fraud triangle also have a financial dimension, influenced by the financial performance, financial structure and degree of liquidity/solvency of the entity.*
- H2:** *At the level of fraud risk by objects of activity, there are significant differences, depending on the identified financial dimensions of the fraud triangle. Thus, it is proposed to estimate the parameters of the fraud risk assessment model.*

Starting from the proposed hypotheses, the analysis will be carried out to test and validate them.

### **3. Research methodology: population, sample, models and variables, data source, data analysis methods**

In order to test the research hypotheses, a statistical approach is proposed (Jaba, 2002; Robu, 2021) which considers: identification of the population, selection of the sample, choice of variables, establishment of data analysis methods and proposal of econometric models to be analyzed, data collection and processing, as well as obtaining the research results and their interpretation (Grosu *et al.*, 2023).

#### **3.1. The studied population and analyzed sample**

In order to analyze and assess the risk of fraud, the target population is represented by all entities listed on the Bucharest Stock Exchange, whose financial statements are subject to statutory financial audit, in accordance with Law no. 162/2017 regarding the statutory audit of annual financial statements and consolidated annual financial statements and amending certain normative acts, published in the Official Gazette of Romania no. 548/12 July 2017 and the selected sample includes only entities on the regulated market.

In order to carry out the proposed study, we want to analyze a sample containing a number of 14 entities listed on BVB, in the Premium and Standard categories, drawn randomly. According to the object of activity of the analyzed entities, the sample structure is as follows: 42.86% are chemical-pharmaceutical entities, 28.57% are entities active in tourism and other services.

In choosing the period under analysis, the study of the entities will take into account the period culminating in the emergence and manifestation of the Covid-19 pandemic, respectively post-pandemic.

Data on the analyzed entities (field of activity, financial information, auditor) will be extracted from the financial statements related to each entity, using the online database of Bucharest Stock Exchange.

#### **3.2. Variables analyzed, data source and models proposed for testing**

Within the study, for the sampled entities, the audit reports issued by auditors, CAFR members, for the financial years between 2019-2021 were consulted. All reports had an unqualified opinion. However, for a number of 16 reports out of the 42 with an unqualified opinion, it was possible to highlight some aspects that, although insignificant, were at odds with the manner of faithful representation of the information in the financial statements.

In this study, entities for which a number of elements were not identified that contradicted the reference accounting framework in audit reports that presented an unqualified opinion were classified as entities without risk of fraud on financial statements. Entities for which a number of elements or other aspects were identified that contradicted the reference accounting framework, in audit reports that presented an unqualified opinion, were classified as entities at risk of fraud on the financial statements.

At the level of the analyzed sample, based on the aspects signaled by the auditor in the audit reports, for entities at risk of financial fraud, unqualified opinions were issued in 100% of cases. It should be noted that in the study, entities were classified into risk groups according to the contradictory aspects signaled and formulated in the opinions in the audit reports, and not according to the opinion formulated by the auditor. Depending on the classifications made regarding the existence of contradictory facts reported by the auditors, it was proposed to analyze and assess the risk of fraud on the financial statements reported by the entities listed on BVB, for the financial years 2019-2021.

In order to test the hypotheses formulated and obtain the results, the study used a series of quantitative variables proposed by the specialized literature for the analysis and evaluation of fraud risk. Quantitative variables, also called numerical, are countable or measurable and are classified into discrete or continuous (Jaba, 2002, p. 25). These variables are represented by a series of financial ratios that describe both the position and financial performance of the entity.

Table no. 1. List of independent variables used in the study

Symbol	Variable description	Calculation mode
Commercial profitability ratio (X1)	Return on sales of the entity	Net result/Turnover
Intangible assets ratio (X2)	Degree of capital investment of the entity	Intangible assets/Total assets
General liquidity ratio (X3)	Extent to which current liabilities can be financed from current assets	Current assets/Current liabilities
Current assets ratio (X4)	Elasticity of the entity to market demands	Current assets/Total assets
Term indebtedness ratio (X5)	The proportion in which long-term liabilities participate in the formation of the entity's total financing resources	Liabilities greater than 1 year/Total asset
Global indebtedness ratio (X6)	Degree of dependence of the entity on financial resources from third parties	Total Liabilities/Equity
Financial profitability ratio (X7)	Return on equity involved in the entity's overall business	Net income/equity

Source: own processing

The data presented in Table no. 1. were collected manually, data collection was carried out at the level of financial statements reported by the sampled entities, the number of observations being 42 (14 entities x 3 financial years).

In order to obtain the results of the study on fraud risk analysis and evaluation, a series of methods specific to financial analysis were used in the paper, as follows: PCA - the principal component analysis, ANOVA - analysis of variance.

The principal component analysis involves synthesizing as much as possible the analyzed data, in order to better interpret a large number of initial data, but also to identify their common nature. The main purpose of this method is to reduce the number of analyzed variables by replacing them with 2-3 latent variables, thus eliminating collinearity, respectively facilitating the analysis.

Starting from a set of initial variables,  $X_i$  ( $i=1...n$ ), we identify new variables, called factors or components, of the form:

$$C_j \text{ (j=1...m), unde } C_j = b_{j1}X_1 + b_{j2}X_2 + \dots + b_{jn}X_n, \text{ iar } m \leq n.$$

Under this method, the main components determined by the linear combination of initial variables are independent of each other. In addition, specific to this method of analysis is the hypothesis of independence of the main components, which can be validated by several tests, such as: test  $\chi^2$  statistics, used to test the existence of a link between variables, and KMO (Kaiser-Meyer-Olkin) statistics, used to determine the strength of this link.

KMO statistics are defined on the range [0,1]. KMO values below 0.5 indicate insignificant links, values between 0.5 and 0.6 indicate mediocre links, values between 0.6 and 0.7 indicate links of acceptable intensity, values between 0.7 and 0.8 existence of good links, KMO values above 0.8 indicate the presence of very good links, and values higher than 0.9 indicate that the solution obtained from PCA application is excellent (Lebart *et al.*, 2006, pp. 186-190).

In the proposed model,  $C_i$  ( $i = 1..3$ ) represents the independent variables (factors/components identified by PCA),  $\beta_i$  ( $i = 0..3$ ) the coefficients of the logistic regression model and  $\epsilon$  represents the error component. In the study, the treatment of the data subjected to analysis was carried out with the help of the statistical program SPSS 22.0.

#### 4. Results and discussions

The application of PCA on the 7 variables introduced in the analysis ( $X_i$ ,  $i = 1, \dots, 7$ ) led to the identification and estimation of the main components that cause fraud, at the level of the analyzed sample. Following the introduction into the PCA of the variables in Table no. 1., a significant link can be seen between the variables proposed in the analysis. The intensity of this link is supported by an exceedance of the threshold value of 0,5 for the Kaiser Meyer-Olkin statistical test ( $KMO = 0,542$ ) (see Table 2). The value of the test statistic used to test component independence, KMO, is 0,542, indicating the existence of a significant link between the initial variables that entered the structure of the resulting main components, according to the data presented in Table no. 2. The results obtained indicate that the assumption of independence of variables is accepted, for a  $GI = 0,00$ , below the minimum materiality threshold of 0,05.

Table no. 2. The value of KMO statistics for testing the existence of association between variables included in the analysis

Kaiser – Meyer – Olkin Test (KMO)		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	<b>0,542</b>	
Bartlett's Test of Sphericity	Approx. Chi-Square	186,426
	df	21
	Sig.	0,000

Source: Own processing in SPSS 22.0.

Through the linear combination of the seven variables, financial ratios, introduced in the analysis, three main components are obtained that explain, to a significant extent, the occurrence of fraud risk at the level of the entity sample analyzed during 2019-2021. According to the data in table no. 3., the three main components obtained through PCA, characteristic of BVB listed entities, explain **78.820%** of the variation associated with fraud risk. Based on the data obtained, it can be seen that 33.884% of the change in fraud risk is explained by component 1, 59.412% of the variation by component 2, and 19.408% of the change in fraud risk is explained by component 3. The remaining 21.181% of the variation is explained by the influence of other factors not included in the analysis that grouped into insignificant components (4-7).

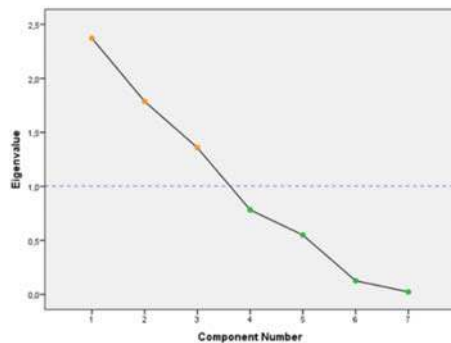
Table no. 3. Establishing the number of components according to Benzecri's criterion

Components	The initial value of the eigenvector			The initial value of the eigenvector in the case of rotation of the factorial axes		
	Total	% from variance	Cumulative %	Total	% from variance	Cumulative %
<b>1</b>	2,372	33,884	33,884	2,372	33,884	33,884
<b>2</b>	1,787	25,527	59,412	1,787	25,527	59,412
<b>3</b>	1,359	19,408	<b>78,820</b>	1,359	19,408	78,820
<b>4-7</b>	<1,000	21,181	100,00	1,483	21,181	100,00

Source: Own processing in SPSS 22.0.

In the process of selecting the number of main components of fraud risk, compliance with Benzecri's criterion was taken into account, which establishes as significant components for which the eigenvector value is greater than 1. From Table No. 3., as well as from the diagram in figure no. 1 It can be noted that for the first three components of fraud risk, the values of the associated own vectors are higher than the established threshold, one. For the other components, the values of the associated eigenvectors shall not exceed the established limit threshold.

Figure no. 2. The values of the eigenvectors associated with the identified components of fraud risk



Source: Own processing in SPSS 22.0.

The three components of fraud risk obtained in PCA, for BVB listed entities, are determined as a linear combination of the seven variables remaining in the analysis. The influence of variables on each of the three components is shown in Table No. 4.

Table no. 4. The structure matrix regarding the influence of each variable, on the dimensions of fraud risk

Variables	Component		
	1	2	3
Commercial profitability ratio (X1)	-0,019	-0,319	0,787
Intangible assets ratio (X2)	0,765	-0,624	-0,002
General liquidity ratio (X3)	-0,450	-0,364	-0,213
Current assets ratio (X4)	-0,774	0,610	-0,004
Term indebtedness ratio (X5)	0,788	0,472	0,014
Global indebtedness ratio (X6)	0,593	0,726	-0,003
Financial profitability ratio (X7)	-0,110	0,203	0,832

Source: Own processing in SPSS 22.0.

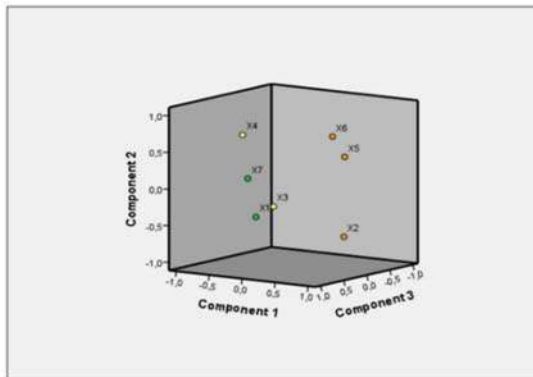
From the data in table no. 4. It can be seen that fixed assets ratios and debt ratios have a significant influence on the first component of fraud risk. Thus, 76.5% of the change in the fixed assets ratio, 78.8% of the change in the forward debt ratio, 59.3% of the change in the overall indebtedness ratio also determine a variation in the values of the first financial component of fraud risk, in the case of entities listed on BVB. Depending on the nature of the variables that dominate component one of risk, its name will be: *Leverage component*.

The second component of fraud risk is significantly influenced by current assets and forward debt ratios, respectively global indebtedness. Thus, 72.6% of the change in the overall indebtedness ratio, 61% of the change in the current assets ratio and 47.2% of the change in the term debt ratio determine a significant variation in the values of the second financial component of fraud risk, in the case of entities listed on BVB. Depending on the nature of the two variables that dominate the second component of risk, its name will be: Liquidity component.

The third component of fraud risk is significantly influenced by rates of return. Thus, 83.2% of the change in the financial rate of return and 78.7% of the variation in the commercial rate of return determine a significant variation in the values of the third financial component of fraud risk, in the case of entities listed on BVB. Depending on the nature of the two variables that dominate component three of risk, its name will be: Profitability component.

The graphical representation of the influence of dominant variables on the three financial components identified for fraud risk, specific to BVB listed entities, is highlighted using the diagram in Figure 2.

Figure no. 3. Representation of the correlations between the financial ratios remaining in the analysis and the three financial components of the fraud risk



Source: Own processing in SPSS 22.0.

In the diagram in figure no. 2. One can highlight the achievement of three main components and their influence on variables. At the level of the analyzed sample, we can observe the existence of three main components of a financial-accounting nature that determine the occurrence of financial fraud.

A first component is significantly influenced by levels  $X2 = (Ai/At)$ ,  $X5 = (D>1year/At)$  and  $X6 = (Dt/Cpr)$  describing the entity's chosen financial structure (on the basis of own resources or on the basis of foreign resources). This component explains the occurrence of financial fraud through the pressures (related to financing from foreign resources) to which entities are subjected. In this case, in order to present a favourable and attractive image vis-à-vis potential investors, the entity will resort to inadequate reporting on the financial structure of its resources.

The influence of the Indebtedness Component on the fraud risk can be explained as follows: the increase in the volume of investments based on foreign resources leads, implicitly, to an increase in the degree of indebtedness.

In conditions of a high cost of borrowed capital, the entity's financial results are strongly affected, which also leads to a decrease in the amounts allocated for shareholders' remuneration. This reduces the attractiveness of investors to the shares of the entity listed on the capital market. In conclusion, referring to the three determinants, synthesized in the fraud triangle, the first component resulting from the study can be associated with the pressure factor.

The second component is significantly influenced by  $X4 = (Ac/At)$ ,  $X5 = (D>1year/At)$  and  $X6 = (Dt/Cpr)$ . Referring to the fraud triangle, it can be said that this component can be associated with the opportunity factor. Thus, it can be seen how the presence of liquidity can lead to financial fraud (at least in the form of asset theft), while through a high degree of fixed assets their theft is much more difficult (these can only be encountered at reporting level: depreciation and depreciation).



Component three is significantly influenced by the level  $X_1 = (R_{net} / CA)$ ,  $X_7 = (R_{net}/C_{pr})$ . These indicators characterize the financial performance of the entity through the economic and financial results obtained.

This component explains the occurrence of fraud through financial reporting that aims to misrepresent and hide the truth in financial statements. Based on the determining factors summarised in the fraud triangle, this component can be associated with the reasoning factor, which highlights the fraudster's attitude towards the added value created by the entity. Thus, by virtue of associating the wealth of the entity with personal wealth, the fraudster considers that he is entitled to a share of the gain (reflected by positive, significant values of rates of return), often appropriating it illegally. This leads to financial fraud in the nature of fraudulent reporting.

Once the three main components of fraud risk have been identified, in the case of Romanian entities listed on BVB, the punctual influence of each of the seven variables can be highlighted by a linear combination of financial rates, weighted with corresponding coefficients. In Table No. 5 The parameters of the three econometric models related to the three main components of fraud risk, obtained in the study, are presented.

Table no. 5. Estimates of the parameters of the models associated with the three financial dimensions of the fraud risk

Financial rates	Component		
	1	2	3
Commercial profitability ratio ( $X_1$ )	-0,008	-0,178	0,580
Intangible assets ratio ( $X_2$ )	0,323	-0,349	-0,002
General liquidity ratio ( $X_3$ )	-0,190	-0,204	-0,157
Current assets ratio ( $X_4$ )	-0,326	0,342	-0,003
Term indebtedness ratio ( $X_5$ )	0,332	0,264	0,010
Global indebtedness ratio ( $X_6$ )	0,250	0,406	-0,002
Financial profitability ratio ( $X_7$ )	-0,046	0,114	0,613

Source: Own processing in SPSS 22.0.

Econometric models based on which the values of the three financial components of fraud risk are obtained are as follows:

$$\text{Debt component} = -0,008X_1 + 0,323X_2 - 0,190X_3 - 0,326X_4 + 0,332X_5 + 0,250X_6 - 0,046X_7$$

$$\text{Liquidity component} = -0,178X_1 - 0,349X_2 - 0,204X_3 + 0,342X_4 + 0,264X_5 + 0,406X_6 + 0,114X_7$$

$$\text{Profitability component} = 0,580X_1 - 0,002X_2 - 0,157X_3 - 0,003X_4 + 0,010X_5 - 0,002X_6 + 0,613X_7$$

For components identified through analysis of the PCA core components, descriptive statistics associated with them are presented in Table No. 6.

Table no. 6. Descriptive statistics regarding the components determined by PCA

	Component 1	Component 2	Component 3
N	Valid	14	14
	Missing	14	14
Mean	0,00000	0,00000	0,00000
Std. Deviation	1,00000	1,00000	1,00000
Minimum	-1,78382	-1,86833	-3,32095
Maximum	1,71016	1,81800	2,64123

Source: Own processing in SPSS 22.0.

From the data presented in Table 6, it can be shown that the positive values of the Profitability component indicate the existence of economic and financial profitability at entity level, negative values of this component highlighting the opposite. For the profitability component, positive score values indicate that the entity uses borrowed resources primarily in carrying out its business, while negative values indicate that in external financing the entity uses resources that are settled more than one year.

Through the financial ratios proposed in the study, with the help of PCA, the main components of financial statements whose content ensures the intelligibility of financial information were identified.

## 5. Conclusions

Over time, human society has witnessed various financial scandals, which had as main actors and representatives of the accounting profession, who, using the trust granted by investors, have acquired knowledge in committing or complicity in fraud. As we could see based on the information captured in the specialized literature, the concept of fraud is not a recent one, it makes its presence felt in human society at various stages of its development, while trying to prevent and combat this phenomenon through various normative acts or through specialized professions to support the fight against fraud.

The results of the study led to obtaining a financial profile of listed entities subject to fraud risk and to identifying the determining factors in order to estimate the risk. Based on the associations between a series of quantitative and qualitative variables, the financial profile of the entities listed on BVB subject to fraud risk was made.

The main quantitative variables used are financial ratios of liquidity, leverage, financing, structure, profitability, and the qualitative variables took into account the object of activity, the membership of a particular auditor, the type of audit opinion issued for that entity and the BVB category on which the entity is listed. In order to estimate the fraud risk, the study used established indices and signal indicators on liquidity, leverage, financing, structure, profitability, in order to estimate the parameters of the models.

The limits of the present systematization of the main ideas in the field of financial fraud are determined by the complexity of this issue and by the impossibility of capturing all the factors that lead to the emergence and development of these fraudulent acts of financial nature. The study proposed a qualitative and quantitative analysis of the dynamics of the main ideas and problems that can form the basis of prospective scientific studies.

Through the results of this study, the future directions aim at addressing the same topics of interest at national and international level: fraud risk assessment, identification and analysis of determining factors, modeling a fraud risk profile. However, for visibility in terms of international research, the approach to financial fraud aims to make a series of comparisons at the level of the main systems regulating this issue of fraud, as well as a series of empirical studies on the motivational factors of financial fraud.

## 6. References

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