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Forensic Accounting, a Tool for Detecting and Preventing the Economic Fraud

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Abstract

Economic crime is an increasing threat to the economic development of a state. While the legislative system tries to create tools to detect and prevent fraud, criminals continue to look for ways to commit and benefit from economic crimes, including fraud, money laundering, sanctions avoidance and corruption. Forensic accounting applies scientific techniques and accounting principles to detect fraudulent activities. Due to technological progress, corporate scams have increased enormously, and therefore, the need for forensic accountants has increased.

Professionals specializing in this type of accounting don't just examine financial statements: they take a holistic approach, incorporating statistical analysis, big data and machine learning, interviews, and physical observation to arrive at the truth – which is just as crucial to due diligence as it is to criminal cases.

Keywords: *forensic accounting, professional accountant, economic fraud, financial statements, reporting standards*

JEL Classification: M40, M41

Introduction

Across the globe, the number of fraudulent and suspicious financial activities is on the rise [PricewaterhouseCoopers, 2022]. Consequently, businesses are at risk of unethical and dishonest practices [Wjerathna and Perera, 2020]. The increasing number of business scandals worldwide has created a need for forensic accounting [Islam et al., 2011; Okoye and Gbegi, 2013a]. Financial fraud has become the most serious economic threat in the world, necessitating professional forensic accountants and traditional auditors [Abdullahi and Mansor, 2018].

It is clear that organizations need to meet the needs of various stakeholders (such as users, bankers, investors, shareholders, auditors, non-professional investors, and financial directors) interested in governance and the quality of the reports the organization prepares. Therefore, it is suggested that governments should play an active role in the effort to detect fraudulent activities.

According to Mohd Nassir and colleagues (2016), categorizing fraud based on the risk level for structured and less structured tasks simplifies detecting criminal and fraudulent activities. Financial fraud, a part of the broader category of economic frauds, has negatively impacted the global economy and had a significant effect on the socio-economic environment [Akinbowale, 2020]. Fraud detection and prevention has been recognized as an essential element in accounting activities, with specific responsibilities for internal and external auditors. However, auditors are not directly responsible for preventing or detecting fraud; their primary duty is to ensure that a company's financial statements comply with accounting standards and applicable regulations.

With the increasing frequency of fraud, a new branch called "forensic accounting" has developed [Wijerathna and Perera, 2020]. This complex approach requires a combination of accounting, auditing, and investigative skills to detect or prevent accounting fraud and white-collar economic crimes. Born out of the necessity to address the rise in fraud, forensic accounting has become a crucial field in investigative accounting. It determines whether an individual or organization has engaged in unethical or illegal financial activities [Okoye and Gbegi, 2013a] and establishes involvement in illegal, unethical, or economic activities [Okoye and Gbegi, 2013a]. Forensic accounting is a critical field in the financial world, serving as an essential tool for detecting and preventing economic fraud. It combines accounting principles with criminal investigation techniques to identify and analyze suspicious financial activities. In the current context, where economic transactions are becoming increasingly complex and globalized, the role of forensic accounting is becoming increasingly important in protecting the financial integrity of organizations and economies [Radu, 2009].

The article will explore how forensic accounting contributes to preventing and detecting fraud, discussing the tools and techniques used in this field. It will also address the challenges forensic accountants face in the current context, such as hiding illicit transactions in complex financial networks or using advanced technology to commit fraud. Additionally, it will discuss the importance of collaboration between various actors in the financial, legal, and technological fields to effectively combat economic fraud. It will also highlight emerging trends in this field and how professionals adapt to rapid changes in the financial and technological world.

1. Principles and Techniques of Forensic Accounting

Forensic accounting, also known as investigative accounting or judicial accounting, is a specialized field of accounting that focuses on detecting and investigating financial fraud. This field relies on fundamental principles such as professional ethics, knowledge of relevant legislation, and maintaining the confidentiality of information. Forensic accounting techniques include detailed financial document analysis, standard audit techniques, interviews, and interrogations to obtain additional information. Forensic accountants also rely on advanced technology, using financial analysis software and digital forensics to examine and analyze data. Collaboration with other entities, such as lawyers and regulatory authorities, is crucial, as is the ability to effectively report and communicate findings. Continuous training and education are essential in this field, given the need to stay up-to-date with the latest techniques and developments. By combining accounting expertise, investigative skills, and legal knowledge, forensic accounting plays a vital role in combating fraud and corruption in the financial sector [Tabirca et al., 2020] .

1.1. Fundamentals of Forensic Accounting

Forensic accounting focuses on two main areas: litigation and investigations. In litigation, forensic accountants provide expertise in cases of commercial litigation, disputes over financial damages, insolvency, matrimonial disputes, or other legal cases involving financial aspects. They can work as expert witnesses, offering assessments and opinions in court. In investigations, forensic accountants detect and document fraudulent financial activities, such as money laundering, corporate fraud, fraudulent insolvency, and other types of economic fraud. They use various techniques, such as transaction analysis, document examination, and interview techniques, to uncover evidence of illegal activities.

1.1.1. Tools and Methodologies of Financial Analysis

Tools and Methodologies of Financial Analysis within forensic accounting involve using specialized financial analysis software, which allows for detailed examination of transactions and accounting records. These programs often come equipped with advanced features, including data mining, to uncover patterns and anomalies in financial data. Sampling techniques also play a crucial role in this process, enabling the detection of suspicious trends within a large volume of data. Financial ratio analysis is also vital, used to assess an organization's financial performance and identify unusual deviations that might signal possible fraud. Forensic accounting analysis methodologies include examining trends and patterns in historical financial data to identify unusual activities or inconsistencies. Forensic analysis techniques are applied to discover and interpret evidence of fraud. A notable example in this context is the use of Benford's Law, a mathematical method used to detect irregularities in financial data sets, based on the frequency of occurrence of digits.

Figure 1.

Most important applications of Benford's Law

(Source: authors' processing)

The practical application of these tools and methodologies can be illustrated through case studies, which demonstrate how they have been used to uncover and investigate actual financial frauds. The approach to these techniques, along with the adoption of best practices and advice for forensic accountants, significantly contributes to the efficiency of the process of detecting and investigating potential frauds, thereby strengthening the financial integrity of organization.

1.1.2. Investigation Techniques and Fraud Detection

A forensic accountant focuses on identifying suspicious activities in an organization's financial records [Das, 2012]. Their role in fraud detection includes essential aspects such as: Analysis, Interpretation and Presentation of complex financial data, supplemented with adequate and relevant information [Wijerathna and Perera, 2020].

The crucial contribution of a forensic auditor in fraud identification can be divided into four main categories:

- Accounting;
- Auditing;
- Fraud investigation;
- Litigation support [Okoye and Mbanugo, 2020].

Analyzing various commentaries is a method used to track progress in fraud research, exploring different prevention and detection strategies, such as the theory of relative size factor analysis [Ozili, 2020]. Data mining, password protection, selective sampling, report analysis, and Benford's Law are used in forensic accounting to detect fraud [Jain and Lamba, 2020]. Operational audits, audit committees, enhancing internal controls, fraud reporting policies, staff rotation, dedicated fraud reporting hotlines, and the role of forensic auditors are among the most effective methods for fraud detection and prevention [Othman et al., 2015].

With the rapid increase of economic crimes in India, integrating forensic accounting techniques is vital for the long-term success of the Indian corporate sector [Aruna et al., 2017]. Two conceptual models in forensic accounting have been developed, focusing on extensive investigations and integrating forensic accounting practices into the corporate structure as an effective approach to minimizing fraudulent incidents [Akinbowale et al., 2020].

As mentioned earlier, forensic accounting services positively impact the prevention and detection of fraud. Therefore, the increased use of these services is recommended to reduce the incidence of fraud and improve the quality of financial reporting [Abdulrahman et al., 2020]. Forensic auditors require specific skills, including critical thinking, deductive analysis, unstructured problem-solving, analytical skills, flexibility in investigations, oral and written communication, negotiation, conflict management, research, economic loss calculation, business valuation, and skills in investigating money laundering [Umar, 2020].

1.2. The Role of Technology in Forensic Accounting

Technology plays a crucial role in forensic accounting, facilitating the detection, analysis, and prevention of financial frauds. Modern technologies enable quick and efficient analysis of large volumes of financial data. Specialized software can identify unusual patterns or suspicious transactions that may indicate fraudulent activities. For example,

machine learning algorithms and artificial intelligence can detect anomalies in financial reports or banking transactions.

1.2.1. Software and Computer Systems Used in Fraud Detection

In the digital age, software and computer systems have become essential tools in the arsenal used for fraud detection in forensic accounting. These technologies allow for detailed and rigorous analysis of financial data, identifying transactions and patterns of suspicious behavior. Modern tools include advanced financial analysis software, which enables real-time transaction evaluation, discrepancy identification, and unusual pattern detection. For example, a data mining program can be used to sift through millions of transactions to find statistical anomalies, such as unusually large transactions or unusual frequencies of certain types of transactions.

Analytical software that utilizes Benford's Law can effectively identify transactions suspicious of fraud [Bierstaker et al., 2006]. Additionally, a strategy known as "logic bombs" has been developed as a security measure against software piracy, being implemented in programs to prevent unauthorized use [Seetharaman et al., 2004].

Another important aspect is systems that use artificial intelligence (AI) and machine learning to identify warning signs of fraudulent behavior, learning from historical patterns and continuously adjusting to become more effective [BinSaeed et al., 2023; Danaila et al. 2022]. These can include, for example, algorithms that monitor user behavior and transactions to identify activities that deviate from established norms, a possible indication of fraud.

1.2.2. Big Data and Predictive Analysis in Fraud Prevention

In fraud prevention, Big Data and predictive analysis have revolutionized the way organizations approach financial security. Big Data involves collecting and analyzing huge volumes of data - from financial transactions and customer behavior to market trends - to identify hidden patterns and trends. This data-driven approach enables not just the detection of fraud after it occurs but also the prediction of potential fraud before it happens.

Predictive analysis uses advanced algorithms and machine learning techniques to analyze these massive data sets and identify patterns that predict fraudulent behavior. For example, a predictive analysis system can examine a customer's transaction history and flag transactions that significantly deviate from usual patterns, indicating possible fraud. Additionally, these systems can be used to identify internal fraud risks by analyzing employee behavior patterns and flagging any suspicious activity.

By implementing these technologies, organizations can develop proactive strategies for fraud prevention. These may include improving internal controls, adjusting financial security policies, and developing a business environment more resilient to fraud. Thus, Big Data and predictive analysis not only detect fraud but also contribute to creating an organizational culture where fraud prevention is a continuous priority.

2. Detection and Prevention of Economic Frauds

The detection and prevention of economic frauds are complex processes that involve a range of strategies and technical tools. In cases where fraud is suspected, accountants and forensic analysts can conduct detailed investigations to gather evidence and understand how the fraud was committed.

2.1. Types of Economic Frauds and Their Identification

2.1.1. Internal and External Frauds

Frauds can be classified based on their origin into two main categories: internal and external.

Internal Frauds: These are committed by individuals within the organization, such as employees, managers, or even directors. Internal frauds can include various illegal or unethical activities, such as embezzlement, theft of assets, falsification of accounting records, fraud in financial reporting, or breach of trust. An employee embezzling money from the company's cash register or manipulating financial reporting systems to hide losses or misappropriation of funds is a common example of internal fraud.

External Frauds: These are committed by individuals or entities outside the organization, such as customers, suppliers, or other external partners. Examples of external frauds include scams, email or internet frauds (such as phishing), forgery of documents to obtain undue benefits, or price manipulation in commercial transactions. A specific example could be a supplier billing for goods or services that were never delivered or a customer using false information to obtain credits or undue discounts.

Each type of fraud presents its own challenges and requires different prevention and detection strategies. While internal frauds can often be more difficult to detect due to direct access to the organization's resources and information, external frauds can be combated with robust security measures and rigorous checks of external partners and transactions.

2.1.2. Other types of Economic Frauds

Misappropriation of assets is a type of fraud that involves unauthorized theft or misuse of an organization's assets. This can take various forms, such as direct theft of cash and checks from the company, check forgery, or stealing items from inventory, including physical products, raw materials, or any other goods held by the company. Also, payroll fraud is another common form, which can involve the existence of ghost employees, meaning paying salaries to nonexistent workers, or manipulating the payroll system to receive higher payments.

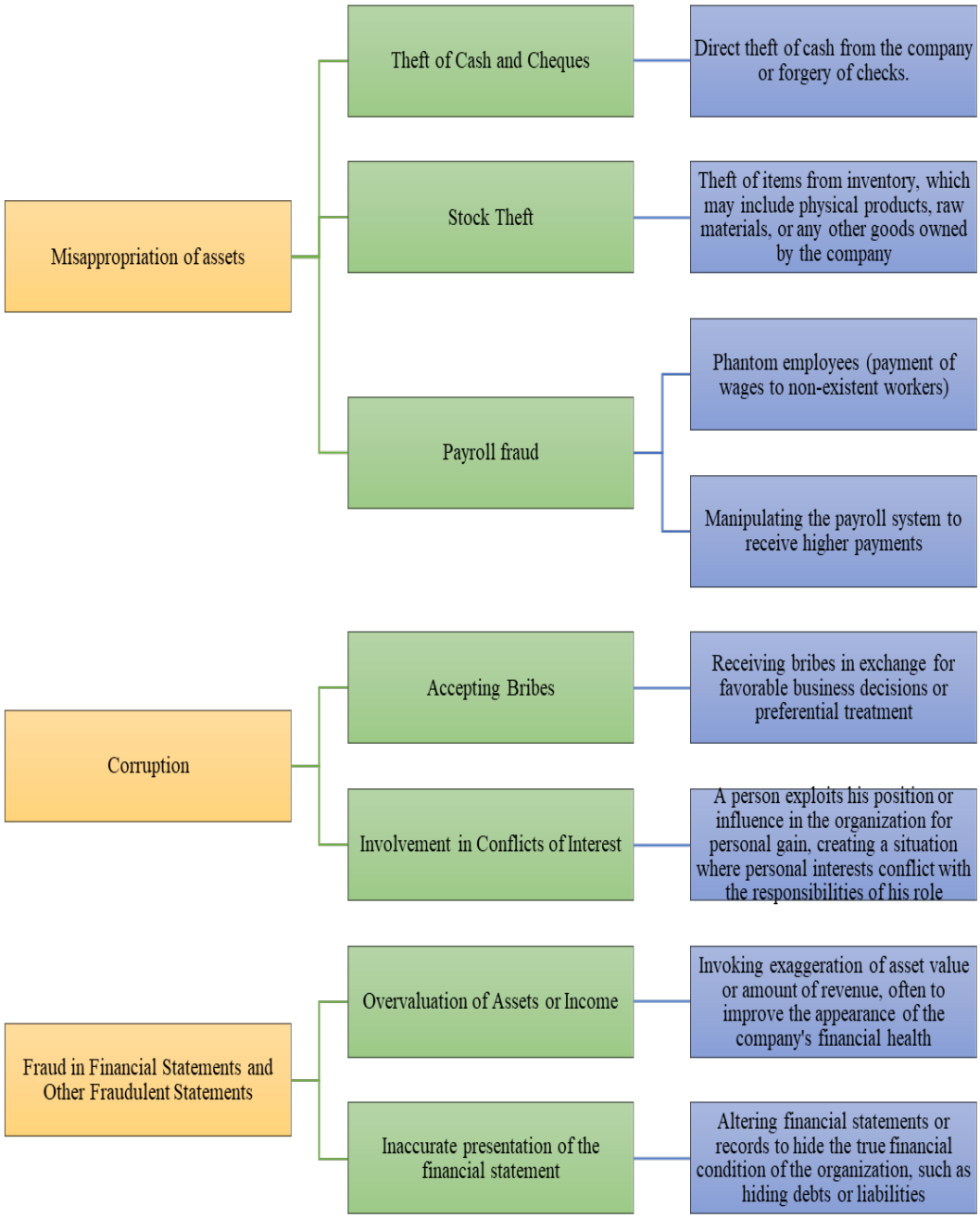
Corruption refers to the illegal and abusive use of influence in business transactions to gain personal benefits, which harms the duty to the employer or the rights of other parties involved. This type of fraud includes accepting bribes, where a person receives material benefits in exchange for favorable business decisions or preferential treatment. Also, involvement in conflicts of interest represents another facet of corruption, occurring when an individual exploits their position or influence in the organization for personal gain, thus creating a conflict between personal interests and professional responsibilities.

Financial statement fraud and other fraudulent activities include the intentional misrepresentation of financial or non-financial information with the purpose of misleading other parties who rely on this information to make economic decisions [Radu and Tabirca, 2019]. Examples include overstating assets or revenues to improve the appearance of the company's financial health and misrepresenting the financial position, such as hiding debts or liabilities, to mask the real financial problems of the organization. These practices cause direct financial harm and erode the trust of investors, partners, and other stakeholders in the integrity and reliability of the company's financial reports. Fraud can take various forms, and the types of fraud can vary depending on the context and the field in which they occur.

The following types of fraud, shown in the figure bellow, represent significant risks to organizations, both in terms of financial losses and reputational damage. Understanding and identifying these types of fraud is crucial for implementing effective prevention and detection strategies.

Figure 2.

Types of Economic Frauds



(Source: authors' processing)

2.2. Strategies and Practices for Fraud Prevention

Strategies and practices for fraud prevention are crucial for any organization aiming to minimize fraud risks and protect its resources. By implementing these strategies, organizations can create a multi-layered defense line against fraud, safeguarding their assets and reputation.

2.2.1. The Role of Audits and Internal Controls

Within organizations, the prevention and detection of fraud primarily fall under the responsibility of management. According to a 2020 EY report, auditors, along with other members of corporate governance and the reporting ecosystem, play a critical role in this process. They use various techniques to detect fraud, including regression analysis, decision trees, neural networks, Bayesian networks, support vector machines, internal controls, firewalls, password protection, anti-virus software, data mining, and digital analysis software [Sahiti & Bektashi, 2015; Bierstaker et al., 2006].

Although governments and regulatory bodies in various countries have established guidelines for an ethical code of conduct in business, financial scandals continue to occur. While external auditors examine financial statements, they are not always able to detect frauds in these cases and also do not take responsibility for fraud detection. For this reason, the demand for forensic accountants is rising [Baldachino et al., 2020; Borg et al., 2020; Woods et al., 2020].

Audits and internal controls are fundamental to ensuring financial integrity and transparency within organizations. Audits, whether internal or external, provide an objective and independent assessment of an organization's financial systems and reports, helping to identify potential issues or inefficiencies. Internal audits focus on evaluating the effectiveness of internal controls and procedures, providing management with a deep understanding of business risks and recommending improvements. On the other hand, external audits, conducted by independent auditors, verify the accuracy of a company's financial statements, providing external stakeholders such as investors and creditors assurance about their accuracy and completeness.

Internal controls, consisting of policies and procedures established by the organization, are essential to ensure financial and operational integrity, preventing and detecting fraud and error. These include practices such as segregation of duties to reduce the risk of fraud and errors, authorization procedures to ensure transactions are justified, regular reviews and reconciliations to identify and correct irregularities, and physical controls to protect tangible assets. Continuous monitoring and performance evaluation of these internal controls allows organizations to adjust and improve procedures to address identified deficiencies, enhancing operational efficiency and strengthening stakeholder confidence.

2.2.2. Awareness and Education as Preventive Measures

Alshurafat et al. (2020) highlighted the importance of implementing a dedicated educational program in forensic accounting, aligned with the specific needs of the profession and employers' expectations regarding pedagogical approaches. Additionally, Kavanagh and Drennan (2008, p. 279) emphasized that, besides basic accounting competencies and advanced analytical skills, it is essential for accounting graduates to develop a deep understanding of business and acquire practical knowledge relevant to the real-world

business environment. This perspective underscores the need for training that goes beyond the traditional theoretical framework, focusing on practical applicability and awareness of the business context. Awareness and education are critical preventive measures in the fight against fraud within organizations. Informing employees about different types of fraud, their warning signs, and their consequences is essential for creating an organizational culture that promotes integrity and transparency. Employees can become more vigilant and recognize potential threats and fraudulent behaviors through training and awareness programs.

Education and awareness are not limited to accounting personnel or financial departments; they should be extended to all levels of the organization. For example, training sessions explaining internal policies and procedures, the company's code of ethics, and the correct way to report suspicions of fraud are vital. This also includes training on the safe use of technology and information systems, which play a crucial role in preventing cyber fraud.

Moreover, educating management and boards of directors about the risks of fraud and how they can impact the organization is equally important. Managers need to be aware of their responsibilities in detecting and preventing fraud and be able to create an environment where employees feel comfortable reporting any suspicions without fear of retaliation. Therefore, awareness and education are key components in creating a defense system against fraud, helping to establish an organizational culture where integrity and accountability are valued and promoted.

3. Applications of Forensic Accounting for Fraud Prevention and Detection

As previously mentioned, a limited number of studies address the application of forensic accounting techniques for fraud prevention and detection. Among these research works is the study by Wijerathna and Perera (2020), which utilized the SLR technique and primarily focused on forensic accounting in the educational sector; the study by Ozili (2020), which analyzed recent advancements in the specialized literature of this field, highlighting several key aspects; and research conducted by Akinbowale (2020), which assessed the effectiveness of forensic accounting techniques. Additionally, a study by Digabriele and Huber (2015) investigated themes and techniques used in research published in forensic accounting journals, noting that most of these studies focus on fraud and quantitative methods. They pointed out deficiencies in terms of research themes and methodologies in this field, suggesting the need for more varied approaches and innovative methods that can benefit professionals in forensic accounting.

This finding, that only a limited number of studies have focused on the available techniques for detecting and preventing fraudulent activities and on identifying challenges in implementing forensic accounting, has directed the current study towards three distinct areas: fraud detection, fraud prevention, and challenges encountered in the field of forensic accounting.

3.1 Research Design and data Sources

The economic development area of this study is South Muntenia. For this study, we chose to use a survey research design. Designing a survey is an efficient method to assess opinions using a questionnaire or an interview administered to a large number of respondents. Surveys allow researchers to collect data on contexts, practices, or perceptions at a specific time, using questionnaires or interviews. The survey-based research design was

chosen for this study to gather subjects' opinions on the investigated theme. The study sample included accounting experts from the South-Muntenia region. In total, researchers distributed 206 questionnaires, but only 108 of these were recovered in a usable form, representing the number of participants from the selected categories who contributed to the study.

This research focused on collecting primary data through a well-structured questionnaire. The questionnaires were distributed over two weeks in November 2023 and are part of a broader research aiming to determine the role of forensic accounting in financial reporting in the pre-merger phase. In the study, the questionnaire was organized based on the Likert scale, used to collect respondents' answers to various instrument items. A questionnaire consists of a set of relevant questions developed by the researcher based on a specialized literature review. It aims to extract information from the study respondents [Kumar, 2010]. The questionnaire included two parts: the first part targeted general information about the respondents, while the second part contained questions derived from the study's research objectives. The second part was structured using the Likert scale, a summary evaluation method also known as the Likert scale. This design is based on the idea that each element of the instrument has an equal attitudinal value, that is a similar "importance" or "weight" [Kumar, 2010].

3.2 Results and Discussions

Demographic Profile

We present in the following table the proportion of questionnaires completed according to the different subcategories in the demographic section of the questionnaire for the final sample.

Table 1.

Respondents' biographical data

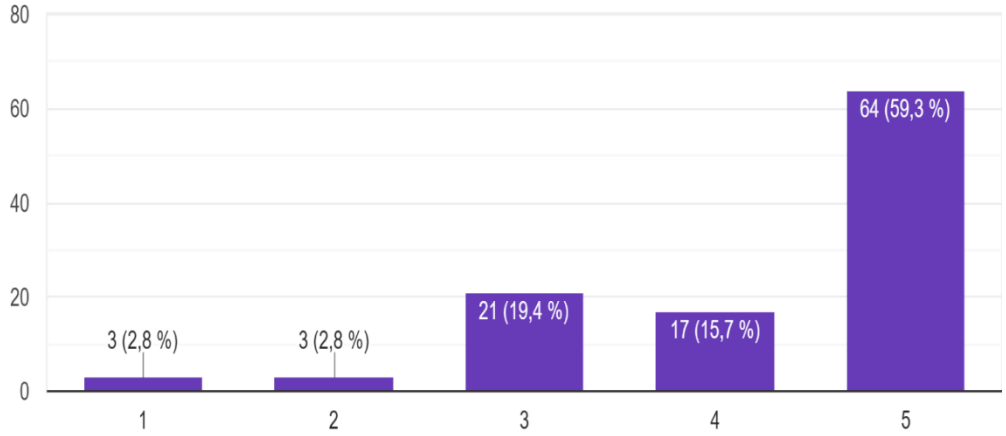
Category	Distribution	Number	Percent (%)
Entity size category	microenterprise	76	70,4
	small enterprise	16	14,8
	medium-sized enterprise	10	9,3
	large enterprise	6	5,6
Total		108	100
Company's age	Less than 2 years	10	9,3
	2 – 5 years	26	24,1
	5 – 10 years	29	26,9
	Over 10 years	43	39,8
Total		108	100
Type of the entity's capital	State capital	12	11,1
	Foreign private capital	5	4,6
	Romanian private capital	90	83,3
	Mixt private capital	1	0,9
Total		108	100

(Source: authors' processing)

The table above revealed data about companies in the respective categories. From the table, 76 entities (i.e., 70%) are classified as microenterprises, 16 entities (i.e., 15%) as small enterprises, 10 entities (i.e., 9%) as medium-sized enterprises, and 6 entities (i.e., 6%) as large enterprises. The table showed that the majority of the companies have been in operation for over 10 years (i.e., 40%), while firms with an age under 2 years constitute 9%.

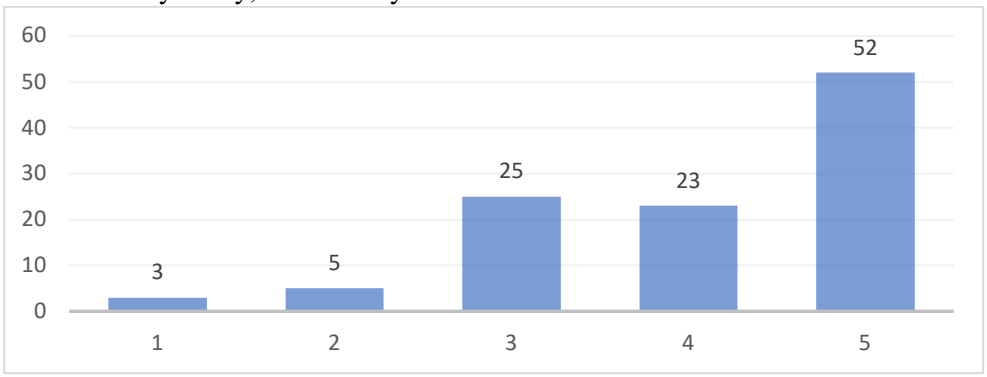
Finally, the table presents the distribution of companies according to the type of capital, where 90 companies (i.e., 83%) have Romanian private capital, 12 companies (i.e., 11%) have state capital, 5 companies (i.e., 5%) have foreign private capital, and one company (i.e., 1%) has mixed private capital. Next, we will calculate using the Pearson correlation coefficient whether there is a significant relationship between the risk of financial fraud and one of the forensic accounting tools, namely technology and accounting software, within firms in Romania, based on data received from respondents to two of the questions asked.

To the question: "To what extent do you think that current accounting technology and software help in preventing and detecting fraud?" researchers received the following responses, where 1=to a very small extent, and 5=to a very large extent:



(Source: authors' processing)

Also, in response to the question: "How often have you encountered financial fraud cases in your professional practice?" the respondents provided the following answers, where 1= very rarely, and 5= very often:



(Source: authors' processing)

Table 2.

Result Details

Calculation	**Key**
X Values ∑ = 440 Mean = 4.074 ∑(X - Mx)2 = SSx = 123.407 Y Values ∑ = 460 Mean = 4.259 ∑(Y - My)2 = SSy = 116.741 X and Y Combined N = 108 ∑(X - Mx)(Y - My) = 93.926 R Calculation r = ∑((X - My)(Y - Mx)) / √((SSx)(SSy)) r = 93.926 / √((123.407)(116.741)) = 0.7825 Meta Numerics (cross-check)	*X*: X Values *Y*: Y Values M_x: Mean of X Values M_y: Mean of Y Values $X - M_x$ & $Y - M_y$: Deviation scores $(X - M_x)^2$ & $(Y - M_y)^2$: Deviation Squared $(X - M_x)(Y - M_y)$: Product of Deviation Scores
Results: r = 0.7825	

(Source: authors' processing)

The Pearson correlation between "To what extent do you think that current accounting technology and software help in preventing and detecting fraud?" and "How high do you consider the risk of financial fraud in your field of work?" is 0.7825, indicating a strong positive correlation between the two variables. This correlation suggests a close link between the assessment of the efficiency of current accounting technologies and software, as a tool of forensic accounting in preventing and detecting fraud, and the perception of the risk of financial fraud in the field of work. In other words, respondents who attribute greater efficiency to accounting technologies and software for combating fraud tend to perceive a higher risk of financial fraud in their field of work. This could reflect an awareness of the importance of technology in managing fraud risks.

Table 3.

Test of correlation

		Forensic accounting techniques	**Fraud deterrence**
Forensic accounting techniques	Pearson Correlation	1	.7825**
	Sig. (2-tailed)		.000
	N	108	108
Fraud deterrence	Pearson Correl.	.7825**	1
	Sig. (2-tailed)	.000	
	N	108	108

**. Correlation is significant at the 0.01 level (2-tailed).

Source: SPSS Ver. 20

Conclusion

Economic and financial crimes are often more challenging to detect and prove than other types of traditional crimes, due to their complexity. While their effects are extremely serious, due to the significant damages caused and the large number of people affected, these are not always immediately visible and tend to manifest over a long period. Because the outcomes of these crimes are not as evident as in cases of murder or drug trafficking, they are often less present in the media.

One of the main effects of tax evasion is the shortage of public financial resources, resulting from the evasion of registration and payment of taxes and duties owed to the budget. These resources are thus diverted from their initial purpose towards the underground economy. This phenomenon erodes the efficiency of the fiscal system, as there is a discrepancy between the potential level of taxes and the amounts actually collected from taxpayers.

The omnipresence of tax evasion compromises the state's ability to fulfill its functions. It can lead to social disturbances, such as delays in paying pensions, salaries, or social benefits. This can lead to decreased labor productivity and increased unemployment, which, in turn, can trigger uncontrolled inflation. Consequently, a negative shift occurs in society's value system, with long-term effects that impact education and culture, although these cannot be quantified in monetary terms. Individuals involved in criminal groups become negative role models for others, attracted by the idea of achieving prosperity through illegal means.

Despite the material costs and human efforts required to combat tax evasion, these must be assessed in relation to the medium and long-term benefits they can bring. The social and material utility of these efforts should not be overlooked, as they contribute significantly to the welfare of society.

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