

## Identifying money laundering risk indicators: Evidence from Bulgaria

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**Abstract:** The study of the fight against money laundering in Bulgaria takes on a heightened significance due to the country's unique geopolitical and economic context. As a member of the European Union and a key regional player, Bulgaria assumes a pivotal role in preventing cross-border crimes, including money laundering. The present study aims to analyze how modern technologies can bolster this crucial role, facilitating monitoring and analysis processes to enhance the effectiveness of audit and tax inspections in the country. The research applied practical methods involving digital tools and technological solutions such as artificial intelligence and machine learning. These tools were used to identify risk patterns and anomalies in transaction data, demonstrating their real-world application and effectiveness. They enable fast and accurate analysis of large volumes of data, which is particularly important in the context of sophisticated money laundering schemes. The results of the study underscore the potential benefits of technological innovation in the field of financial audits. With the aid of digital technologies, supervisory authorities in Bulgaria stand to significantly enhance their ability to detect financial abuses, including money laundering and tax evasion. In conclusion, the study reiterates the pressing need for further integration of modern technological solutions in the practices of audit and tax services in Bulgaria. This integration is crucial to ensure the effectiveness of control mechanisms and the country's ability to respond to current and future challenges in the fight against crimes in the financial sphere, underscoring the urgency of this matter.

**Keywords:** Audits, Cross-border crimes, Financial technologies in Bulgaria, Prevention of money laundering, Tax control.

### 1. Introduction

Identifying the factors that minimize the money laundering process is a severe challenge worldwide (Loayza, Villa & Misas, 2019). It is because money laundering facilitates the legalization of income originating from illegal activities. Complex financial operations, transactions and different financial instruments contribute to the problematic detection by the control authorities of illegal actions (Boghean, 2007). In this regard, Bulgaria needs to take action to prevent financial abuses by strengthening the regulatory framework and the financial system's stability. An essential role is played by the creation of national and international databases that support the sharing of information between different countries and institutions (Shearman & Zendulková, 2019). This global cooperation is fundamental to the effective tracking of cross-border financial flows and the prevention of large-scale money laundering schemes (Trozze, Davies & Kleinberg, 2023). Using international data provides supervisory authorities with essential tools for verifying and cross-checking transactions (Stoykova, 2022), significantly increasing their ability to detect and warn of potential risks related to illegal financial operations. In this context, identifying money laundering risk indicators is a critical component of financial compliance and risk management (Ogbeide, et al., 2023). Obligated entities are under constant pressure to improve their systems and processes in order to identify and block potential money laundering attempts effectively (Akartuna, Johnson & Thornton, 2022). As key players in the financial

sector, auditors play a crucial role in evaluating risk factors (Kostova, 2024). They do this by relying on national analyses and a comprehensive assessment prepared by the professional organization.

With the development of financial technology, auditing practices are undergoing a significant transformation (Abdullah & Almaqtari, 2024). Modern auditing techniques are not just optional tools, but a necessity in the battle against money laundering. With the rapid digitalization in business organizations, it is crucial for auditors to apply adequate algorithms for analyzing their data, modern IT solutions, and artificial intelligence. These are the foundation of methods for identifying suspicious transactions and behavior in real time. (Zhelev & Kostova, 2024). The value of traceability systems that encompass the processing and analysis of large databases, which are not detectable through traditional verification methods. The implementation of machine learning and big data processing techniques (Suleiman, Al-Zewairi & Naymat, 2017) is proving to be particularly valuable for audits in the financial sector. These technologies are integrated into the analytical processes of business organizations to analyze transaction flows and build customer profiles, enabling auditors to gain deeper and more accurate knowledge of customer behavioral patterns. This, in turn, allows auditors to more effectively identify anomalies and deviations that are indicators of potential money laundering activities.

The study of the latest trends in technology for monitoring and analyzing financial transactions (Gao, 2023) is essential for formulating anti-money laundering strategies. It involves studying different approaches and methods implemented in different jurisdictions and evaluating their effectiveness. It is also essential to consider the potential legal and ethical issues associated with using these technologies, particularly in protecting personal data and privacy. For instance, specific legal and ethical issues may arise when implementing these technologies.

This article aims to examine and analyze different methods for identifying potential money laundering risks in Bulgaria, with particular attention directed to applying modern auditing and tax techniques. Through this analysis, suggestions for complementing audit and tax audit techniques are derived by answering the following research questions:

1. *To what extent can audit and tax techniques be adapted and applied in the Bulgarian context to strengthen the financial system?*
2. *How will auditing and tax techniques better protect against financial abuse?*
3. *To what extent does the competence of supervisory authorities contribute to the detectability of money laundering schemes?*

In order to answer these research questions, not only are the existing methods and tools covered, but also how they can be adapted and applied to the Bulgarian context is explored. Based on international experience and modern technological achievements, effective mechanisms can be developed to strengthen the local financial system and improve its resilience against potential financial threats. These mechanisms can be practically implemented in the Bulgarian financial system by specific implementation steps. The current research examines the integration of innovative software solutions and monitoring systems based on advanced algorithms and artificial intelligence technologies. The purpose of these systems is to process and analyze large volumes of transactions in real time, which allows the monitoring of regular financial activity and the identification of anomalies that may be indicators of money laundering. The analysis may include electronic surveillance and algorithmic analysis systems used in other countries, which help improve Bulgarian monitoring systems.

The research is based on the analysis of the current conditions and operational mechanisms available in the country, aiming to identify how international norms and standards can be effectively integrated into the Bulgarian legal and financial system. Among the specific challenges that Bulgaria faces are the insufficient regulatory framework, the limited resources for supervision and control, as well as the need to raise public and institutional awareness of the seriousness and complexity of the problems related to money laundering. The urgency of addressing these issues cannot be overstated, and immediate action is needed to strengthen the institutional frameworks and improve coordination between law enforcement agencies in Bulgaria, sparking a sense of concern and motivation for the public to act.

An important aspect of this article is also the development of strategies to educate and raise awareness among financial institutions and the public about the methods and consequences of money laundering. By understanding the signs and consequences of money laundering, the public can play a crucial role in reporting suspicious activities. This can be achieved through [specific strategies for public education and awareness]. Training of employees in the fiscal and audit sector, as well as public awareness campaigns, can significantly contribute to the prevention of abuses.

As a result, the main purpose of this article is not only to expand the knowledge in the field of money laundering in Bulgaria, but also to support the development and implementation of more effective policies and mechanisms to deal with this serious and complex problem. The improvement of the national framework and the adaptation of successful international practices can significantly increase the effectiveness of anti-money laundering measures, thereby helping to strengthen the country's financial stability and economic security. This research promises to provide practical solutions and insights that can be directly applied by financial institutions and law enforcement agencies in Bulgaria, fostering a more secure and resilient financial system and instilling a sense of hope and optimism for the future.

## 2. Literature Review

### 2.1. Auditing and tax techniques for identifying the risk of money laundering

The study of different approaches to identifying risk indicators is crucial to risk identification. As auditors and tax inspectors, your role is pivotal in this process. An important aspect of your work is that customer profiles are instrumental for audits (Lusardi & Mitchell, 2011), as they provide a systematic way to recognize illegal transactions that deviate from established norms of behaviour.

An essential technique auditors and tax inspectors use is the detailed analysis of transaction data (Sui & Li, 2017). A significant technique employed by auditors and tax inspectors is the meticulous analysis of transaction data. This process involves scrutinizing each transaction over a specific period to identify unusual patterns, such as unexpectedly high fund transfers, frequent transactions for round amounts, or transactions that do not align with the customer's usual business model. This detailed analysis, a potent weapon in the fight against money laundering, is a testament to the power of data in our hands.

The 'know-the-customer' techniques (Kim, Kim & Ahn, 2022) are not just a part of the identification of money laundering risk, they are the cornerstone. These techniques encompass the collection and analysis of comprehensive information about customers, including their identity, origin of funds, business activities, and purpose of transactions. The regular updating of this information and its correlation with transaction patterns is a powerful tool that empowers auditors and tax officials to detect and investigate suspicious activities effectively.

By combining these techniques and methods, you, as auditors and tax inspectors, have at your disposal a robust toolkit. This toolkit empowers you to identify and minimize the risk of money laundering effectively, giving you the confidence to tackle this issue head-on (Segovia-Vargas, 2021). In this context, the effectiveness of control measures depends on the tools used and an integrated approach that includes education, technology and inter-institutional cooperation.

### 2.2. Digitization of audit methods and approaches to identify money laundering risks

Adopting practical strategies for early diagnosis of risks not only serves as a deterrent to potential abuses but also plays a significant role in minimizing the potential negative impact of illegal financial activities on the financial stability and economic security of the state (Cornwell, Bilson, Gepp, Stern & Vanstone, 2023). For example, successfully identifying and blocking money laundering schemes can prevent the spread of funds intended to finance terrorism, drug trafficking or other criminal activities that undermine public welfare and national security.

The advent of artificial intelligence and machine learning has revolutionized the audit landscape. These technologies offer the ability to analyze large volumes of data with unparalleled accuracy and

speed, a feature that proves particularly useful in identifying anomalies and unusual bank transactions (Aleksandrova, Ninova & Zhelev, 2023). AI systems, when harnessed by auditors and tax inspectors, can be trained to recognize typical patterns of legitimate transactions and flag suspicious ones. This empowers these professionals, enabling them to focus their efforts on potentially risky areas with greater precision and efficiency.

Blockchain technology ensures transparency and traceability of financial operations (Tripathi, Ahad & Casalino, 2023). It can be used to create immutable and secure records of transactions, making it easier to verify their legality and authenticity. In the context of tax audits, blockchain can help ensure the accuracy and reliability of tax returns and other financial documents (Zheng, Xie, Dai, Chen & Wang, 2018). Robotic process automation enables the automation of routine and time-consuming audit and tax tasks, such as data collection, sorting and preliminary analysis. It frees up specialists' time to focus on more complex analyses and interpretations of results, increasing overall efficiency and reducing the possibility of human error.

Big Data analytics offers the ability to process and analyze vast amounts of information from various sources in real-time (Stekelorum, Laguir, Lai, Gupta & Kumar, 2021). Big Data analytics, with its ability to process and analyze vast amounts of information from various sources in real-time, offers a powerful tool for identifying trends, correlations, and potential risks. This reassures the audience about the effectiveness of these technologies in preventing abuse and contributing to more accurate audits and tax inspections (Benotmane, Elhari & Kabbaj, 2023). For example, tracking devices can provide information on the movement and use of stored goods, which helps in auditing physical inventories and confirming compliance with the data recorded on the books.

The use of these modern technologies in audit and tax audits contributes to a deeper and more accurate understanding of the financial operations of enterprises, which leads to more effective risk management and improved compliance with legislative requirements. These tools and methods of technological innovation enable faster detection and prevention of potential financial abuses, thereby strengthening the financial system and its resilience.

### *2.3. Competence of Control Authorities for the Detectability of Money Laundering Schemes*

Money laundering seriously threatens global economic stability and the legal system. To effectively counter these activities, supervisory authorities must constantly increase their competence and efficiency in detecting complex money laundering schemes. It includes a series of strategies and measures to improve the relevant institutions' operational readiness and technical security.

The main factor in increasing the competence of the control bodies is investing in staff training and specialization. Regular and targeted training helps employees develop the necessary skills and knowledge to recognize different money laundering schemes. Such training should include familiarization with the latest trends in financial crimes, new regulatory requirements, and technological innovations in financial monitoring.

The integration of modern technologies is critical to improving crime-solving capabilities. Artificial intelligence, machine learning, and blockchain technologies provide opportunities to analyze large volumes of data, detect anomalies, and automate processes, significantly facilitating the identification of suspicious transactions and behaviors. These technological solutions are used to create integrated information systems to support the exchange of information between the various control authorities.

Updating legislation and regulations to reflect current realities and challenges in financial crime is essential to the rationale of supervisory authorities. The legal framework should provide clear powers and tools for action and adequate sanctions for violations, which incentivize compliance with laws and disciplines economic actors (Teixeira, Luz, Silva, Pereira, & Silva, 2024). Training in this direction significantly impacts the choice of audit and tax procedures for taking measures against money laundering.

### 3. Methodology

A survey was conducted as part of our research to identify risk factors and indicators related to money laundering in the practice of auditors and tax consultants. The survey aimed to gather information from professionals who regularly encounter various financial schemes and operations to understand how they recognize and manage potential money laundering risks in their areas of activity. The survey was designed to include questions that address specific aspects of the professional practice of auditors and tax consultants. Registered auditors took part in the study - 296 people; audit firms – 49; international groups - 16 companies and nine companies that follow the rules of a group.

Based on the data, an analysis was carried out, which included a qualitative and quantitative assessment of the responses received. The analysis helped to identify the main trends in the responses and draw specific conclusions about the most common risks and challenges faced by auditors and tax advisors.

Based on the data analysis, the study concluded that practices and procedures for identifying and managing the risk of money laundering should be improved. Among the proposals were increasing regulatory requirements, improving the training and qualification of financial professionals, and introducing more modern technologies for monitoring and analyzing financial transactions.

### 4. Results and Discussion

The prevention and identification of the risk of money laundering is critical to financial stability and legality. Auditors and tax inspectors use various techniques to detect and prevent money laundering, applying a combination of traditional and innovative approaches to adapt their methods to the ever-changing schemes and methods used by criminals. Crimes generating funds that are typically laundered in Bulgaria are often linked to international criminal activity. Based on the data, it was established that in Bulgaria, the risk factors are mainly related to organized criminal activity - 20.00% of the respondents; corruption - 17%; tax crimes – 15.00%; human trafficking - 7%; drug trafficking -15%; forgery - 4% and other - 20%.

Control authorities encounter significant difficulties in identifying suspicions when submitting a report on suspicious operations to investigative services - 4%; identification of beneficial owner -12%; customer monitoring - 25%; implementation of all measures for comprehensive client verification - 12% e); identification of PEPs - 10%; check/verification of data provided by customers - 6%; information storage - 5%; internal rules and control - 19% and others - 4%. Among the respondents, the most likely threats to the auditing profession from clients about anti-money laundering measures were classified as: *risk of fraud by the audited company, which would not reveal objectivity and independence; a request for certification of a false report; seeking advice for illegal tax avoidance; consulting in transformation schemes (mergers, infusions, spin-offs and separations); cover assets; incorrectly reported income, hidden taxes or other characteristics of the true nature of the process; concealment of over-indebtedness; concealment of intentional bankruptcy; misleading information.*

In this regard, the most common weaknesses of the audit profession about anti-money laundering measures are graded as follows: *insufficient information for decision-making; risk of undetected fraud; objectivity and independence; lack of knowledge and experience; lack of resource provision for the fulfilment of commitments; insufficient awareness and understanding of the nature of the transaction and operation; unjustifiably high fees for services rendered; financial problems in the company or among the staff; poor quality of the organization of the activity and internal control in the fulfilment of commitments; insufficient knowledge of the client (business, ownership structure, transactions, services); lack of knowledge and experience to perform an audit engagement of enterprises with very complex activities.*

Using data analysis software can significantly increase the efficiency of this process. The development of mechanisms for continuous monitoring and evaluation of the effectiveness of the implemented measures and strategies allows control authorities to adapt their approaches in response to emerging environmental challenges and technological changes. It also helps identify areas where improvements or additional resources are needed. Through these strategies, supervisory authorities can

improve their ability to detect money laundering schemes and increase their overall competence, which contributes to maintaining financial stability.

The ability of modern technology to analyze this data in real-time provides financial institutions with a powerful tool to prevent abuse. In addition, using automated monitoring systems limits human error and increases the scope of supervision without hiring additional staff. Machine learning and artificial intelligence are increasingly used in financial investigations to identify money laundering schemes. These technologies can analyze large volumes of data, identify complex patterns and predict potential risks, significantly increasing the speed and accuracy of audits. The patterns of behaviour created through digital tools will help identify isolated cases and analyze trends and interrelationships within the broader financial network, which is crucial for the prevention and fight against money laundering.

Cooperation between financial institutions and regulatory authorities is crucial to successfully identifying and preventing money laundering. The exchange of information helps auditors and tax officials get a more complete picture of financial operations and potential abuses. Continuous training and upskilling of auditors and tax inspectors is essential, as money laundering methods are constantly evolving. Regular trainings ensure these professionals know the latest anti-money laundering techniques and technologies. Improving the legislative framework, strengthening the judicial system and increasing the capacity of local authorities to fight financial crimes are essential steps towards building a more sustainable and effective money laundering prevention system (Majid, Meraj, & Mubarik, 2022).

The existence and operations of such providers highlight the need for stricter regulations, more effective methods to monitor and control financial flows, and improved cooperation between law enforcement authorities at national and international levels. The survey found that auditors and tax authorities do not have information related to the existence of such persons and organizations - 98% of those who believe that there are alternative channels for payment and transfer of money, but the volume of their activity is insignificant in the context of the country's economy - 2%. In close cooperation with international regulatory bodies, the Bulgarian authorities seek to control and regulate the activities of such unlicensed operators to reduce the risk of financial crimes. Despite efforts, the problem of unlicensed providers remains challenging due to the nature of their operations, which are often hidden and difficult to monitor.

In addition, the creation of common databases, sharing information on suspicious transactions and the joint conduct of investigations can significantly increase the chances of successfully uncovering and ending criminal schemes. These technologies are precious because of their ability to reveal complex patterns of behavior that traditional methods cannot reveal. Machine learning allows the system to "learn" from previous transactions by recognizing and remembering characteristic signs of suspicious activity. These characteristics include frequency of transactions, sizes of transfers, geographic routes of funds and other factors that deviate from established norms.

Digital technologies improve auditing and tax methods, and improved international information exchange is essential in strengthening financial stability and security. These improvements optimize monitoring and control processes and provide a more comprehensive database and resources to fight money laundering efficiently in the banking sector.

## 5. Future Research Directions

This research provides a basis for a more in-depth study of existing methods and difficulties auditors and tax advisors face in combating money laundering. Future publications may focus on developing more detailed strategies for integrating new technologies and automated systems to increase efficiency and accuracy in identifying suspicious financial transactions.

Research could examine the impact of international cooperation and information exchange between different regulatory authorities and how this cooperation can be optimized to achieve greater



effectiveness in a global context. Thus, through upcoming research, we can offer even more specific and innovative solutions to help professionals in this field deal with money laundering challenges even more successfully.

## 6. Conclusion

In the context of the globalized economy, Bulgaria faces specific challenges related to money laundering, which requires adapting international practices to local conditions. As a member of the European Union and a key regional partner, the country has a vital role in preventing cross-border crimes, including money laundering. This research examines how digital tools and modern technologies can improve the identification of risks and increase the effectiveness of audit and tax inspections in Bulgaria.

The research highlights the importance of integrating new technological solutions, such as artificial intelligence and machine learning, which promise revolutionary improvements in supervisory authorities' ability to analyze large volumes of data and detect suspicious financial patterns. Such tools not only facilitate the rapid identification of potential abuses but also help uncover sophisticated money laundering schemes.

The research results provide guidelines for improving Bulgaria's audit and tax practice. These include recommendations for further introduction of automated systems and enrichment of educational programs for auditors and tax consultants. Cooperation between financial institutions and regulatory authorities and strengthening the international exchange of information have also been identified as critical elements for success in the fight against money laundering. In conclusion, the research supports the need for continued adaptation of the regulatory framework in Bulgaria to ensure that the country remains an effective participant in global financial crime prevention efforts.

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