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Using technological innovations to prevent and combat economic crime

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***Abstract*— The article analyzes how modern technologies contribute to more effective prevention and combating of economic crime. It presents key aspects related to the definition of economic crimes and the role of individual institutions and technological tools used within the European Union to combat them. The focus is on technologies such as artificial intelligence, Big Data analysis, blockchain or financial supervision systems, which enable faster and more precise detection of frauds and their analysis. In the methodological part, the authors conducted an analysis of available literature sources and international reports that provide data on the use of technology in the fight against economic crime. The research results indicate that technological innovations not only accelerate investigative processes, but also allow for more effective monitoring of financial flows and detection of complex money laundering and tax fraud schemes. In particular, data analysis systems enable identification of anomalies in real time, which gives institutions greater flexibility and precision in prosecuting crimes. The article also emphasizes the importance of international cooperation and harmonization of activities at the European Union level, which allows for more effective counteracting of cross-border fraud schemes. The conclusions indicate the need for further investment in the development of technology and the need for continuous education of services responsible for counteracting economic crime. The future of combating this type of crime is based on the synergy of modern technological tools and institutional cooperation, which allows for effective reduction of financial abuses and protection of the stability of the economies of EU Member States.**

Keywords— Economic crime, new technologies, money laundering, financial abuse, corruption.

I. INTRODUCTION

Economic crime, encompassing a variety of illegal financial activities, has become one of the most important challenges facing modern societies. As economies around the world become more complex and globalized, the scale and complexity of financial crime are also increasing. In particular, the phenomenon of so-called "white-collar crime" shows how people of high social status, often in positions of power or in large corporations, use their privileges to commit crimes. These activities, which can include tax fraud, embezzlement, corruption or money laundering, are a challenge not only to the legal system but also to public trust in state institutions and the economy as a whole. The origins of money laundering date back to the 1930s in the United States, where prohibition created conditions for the illegal trade in alcohol, and thus for the generation of huge profits by criminal organizations. At that time, various methods were used to conceal the source of these funds, often by establishing legal businesses such as grocery stores or laundries. Modern methods of money laundering have

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become much more complex, using advanced technology and international networks, making them difficult for law enforcement agencies to detect.

Currently, more and more attention is being paid to the issue of money laundering and other forms of economic crime in the context of organized crime. The traditional approach, focusing mainly on the criminal liability of participants in crimes, is proving insufficient. Even the imprisonment of high-ranking members of criminal organizations does not reduce the scale of crime. Therefore, current strategies to counteract economic crime focus on cutting off criminal organizations from sources of financing. A key element of these activities is to ensure that criminals do not have the opportunity to legalize their illegal income, which consequently weakens their activity.

In response to these challenges, the European Union and its member states, including Poland, have implemented a number of institutions and mechanisms aimed at combating financial abuse. The most important of them operating in Poland include the General Inspector of Financial Information (GIIF), the Central Anticorruption Bureau (CBA). Each of these institutions plays a unique role in counteracting economic crime. GIIF analyses suspicious transactions, blocks them and passes on information to other law enforcement agencies, which is crucial in the context of counteracting money laundering. CBA focuses on combating corruption and monitoring the correctness of asset declarations of persons performing public functions.

The European Anti-Fraud Office (OLAF) protects EU funds from abuse. Another international organisation operating in the area of counteracting economic crime is the Financial Action Task Force (FATF), whose aim is to introduce international legislative and organisational standards in the field of combating money laundering and terrorism financing. Thanks to international cooperation and exchange of information between countries, it is possible to prosecute economic crime more effectively and to limit its scale.

The article will undertake a detailed analysis of the role of the above-mentioned institutions and technological innovations used in their activities to counteract economic crime. Understanding these mechanisms and strategies is crucial for assessing the effectiveness of the fight against this phenomenon and for future legislative and operational activities in this area.]

II. THE SUBJECTIVE APPROACH TO ECONOMIC CRIMES

When referring to the typology of perpetrators of economic crimes, it is worth mentioning the American criminologist Edwin Sutherland, one of the pioneers in the study of this type of crime. He was the first to introduce the concept of "white-collar crime" important for this field, which remains relevant and widely used to this day (H. Fedewicz, P. Kisiel, ,2007 p. 68). This term refers to crimes committed by people of high social or professional status who, taking advantage of the privileges they are entitled to, commit fraud, embezzlement, corruption of officials, violation of professional secrecy, tax and subsidy fraud, unfair competition practices, tender manipulation and violations in the area of import and export of goods. Another characteristic feature of the perpetrators of this type of crimes is their usually high social position and the fact that they do not fit the stereotypical image of a fraudster. The activities of "white collars" often give the impression of legal economic, banking or commercial operations. Due to the specific nature of these crimes, there is a growing conviction in society that such abuses should be punished with exceptional severity (J. Kraciuk, 2012, p. 801).

A "white-collar" criminal differs from an ordinary criminal in his lifestyle and greater sensitivity to the court's verdict. For such a person, the accusation itself, in addition to imprisonment, is often deeply humiliating. There is no doubt that "white-collar" crime is a mass phenomenon, encompassing a number of activities on a large scale, aimed at obtaining significant profits. Nowadays, the activities of organized criminal groups of an economic nature are increasingly observed, which are becoming popular due to large financial benefits and the lack of the use of physical violence. This may lead to the false belief that such crime does not harm anyone.

In further research, mainly by representatives of the Anglo-Saxon school developing Sutherland's concept, a new category of criminals was distinguished - "blue-collar crime". The introduction of this term was intended to distinguish between two types of crimes committed by different social groups. This concept refers to crimes committed by employees of industry, trade and services, referring to their blue work clothes. In contrast to criminals from the middle or upper class, "blue-collar" crimes are characterized by a smaller scale and lower value, and their goal is usually to meet current needs. From an economic perspective, these are most often embezzlement to the detriment of the employer and theft. In the literature, one can also find alternative classifications of perpetrators of economic crimes, which appeared as a result of research by Swiss experts questioning the concept of white-collar crime (L. Wilk 2012, p. 15).

III. STATE AND INTERNATIONAL INSTITUTIONS COMBATING ECONOMIC CRIMES.

Many entities are involved in counteracting and combating economic crime. Below we will discuss the most important state and international bodies that play an essential role in this area. Due to space limitations, a detailed analysis of all institutions will not be possible, so we will focus only on selected ones.

The General Inspectorate of Fiscal Control (GIKS) supervises the activities of fiscal control offices, including fiscal intelligence bodies. Fiscal offices and bodies conduct investigations into cases involving fiscal crimes, act as a public prosecutor in these cases and are involved in the execution of financial penalties.

The General Inspector of Financial Information (GIIF) conducts analyses of suspicious transactions, suspends and blocks them and passes on information about suspicions to other institutions. Its activities play a particularly important role in investigations related to counteracting money laundering.

The role of the Central Anticorruption Bureau (CBA) is to counteract corruption and other activities that may negatively affect the economic interests of the state. The CBA is also responsible for checking the correctness of asset declarations and declarations regarding the conduct of business activities by persons performing public functions.

In the scope of combating economic crime, the prosecutor's office also plays an important role, and the appropriate organizational units are responsible for these activities. At the level of the General Prosecutor's Office, the Department for Organized Crime and Corruption was established, while in the district prosecutor's offices there are investigative departments and departments for economic crime (W. Jasiński, 2013, p. 292).

The Office of Competition and Consumer Protection (UOKiK) conducts antitrust proceedings concerning practices restricting competition and protects the interests of consumers. The activities of UOKiK are of particular importance in counteracting economic crimes, such as bid rigging (H. Gajewska-Kraczkowska, A. Partyka-Opiela, 2016, p. 18).

The most important institution established within the European Union to combat fraud is the European Anti-Fraud Office (OLAF – fr. L'Office Européen de Lutte Anti-Fraude). This office focuses on combating all activities that harm EU public funds and developing strategies to counteract them. OLAF issues recommendations on actions that should be taken by national or EU entities as part of conducting investigations, but it does not impose sanctions. Another international organization operating in the area of economic crime is the Financial Action Task Force (FATF). Its main goal is to counteract money laundering and combat terrorism financing. The tasks of the FATF include, among others, setting legislative and organizational standards at the international level (M. Kutera, 2016, pp. 169-171).

IV. THE ROLE OF TECHNOLOGY IN THE FIGHT AGAINST ECONOMIC CRIME

Technology is a very important aspect in the fight against economic crime, both in terms of its prevention and combating. With the development of the global digital economy, financial institutions, law enforcement agencies and regulators must face increasingly complex threats that evolve in parallel with technological progress. Economic criminals use new tools and methods, such as cybercrime, financial fraud or money laundering, which requires the use of modern technologies to counteract these activities. Modern technological solutions offer new possibilities for identifying, monitoring and combating this type of crime, making the fight more effective and precise (B.Oręziak, M. Wielec, R. Koszewski 2020, p. 125).

One of the essential tools used in the fight against economic crime is the analysis of large data sets (Big Data). Financial institutions such as banks, investment companies or insurance companies process huge amounts of data every day. Analysis of this data allows the identification of anomalies and incorrect transaction patterns that may indicate criminal activities. Advanced analytical algorithms are able to detect even subtle signals of money laundering, fraud or other forms of financial abuse.

Modern monitoring systems based on Big Data technology not only analyze historical transactions, but also predict the risk of future criminal activities based on customer behavior patterns. This type of predictive analytics allows for faster response to potential threats and real-time decision-making (P. Amirian, T. Lang, F. van Loggerenberg 2017, pp. 15-37).

Artificial intelligence (AI) and machine learning (ML) are becoming invaluable tools in the fight against economic crime. AI algorithms can analyze huge amounts of data automatically, identifying patterns and relationships that may escape traditional investigative methods (F. Kurp, 2023, pp. 28-30). For example, in anti-money laundering (AML) systems, AI can analyze financial transactions in real time, identifying those that deviate from the norm and may indicate money laundering. Machine learning allows systems to adapt to changing conditions and learn from new data, allowing them to become increasingly good at detecting fraud. ML models can pick up on subtle patterns in user behavior or transactions that may indicate fraud, even if those patterns were not previously defined by humans.

AI and ML are also used in identity recognition systems, where advanced algorithms can quickly verify the client's identity based on biometrics (e.g. face or fingerprint scanning), which reduces the risk of identity theft and fraud related to false documents (K. Śledziewska, R. Włoch, 2020, p. 230).

Blockchain technology, known mainly as the basis for cryptocurrencies such as Bitcoin, is increasingly used in the fight against economic crime. Blockchain offers a decentralized, unchanging transaction register that is difficult to manipulate, making it an ideal tool for ensuring transparency and security of economic transactions (H. Dikariev, M. Miłosz, 2018, p. 60).

One of the areas where blockchain can be particularly useful is counteracting money laundering. Thanks to the ability to track every step of a transaction in the blockchain chain, financial institutions can better monitor the flow of funds and identify suspicious transactions. In addition, blockchain can automate the processes of identity verification and transaction confirmation, which additionally increases the security of financial operations.

The use of blockchain technology in public tenders, logistics and international trade also helps combat corruption and forgery of commercial documents, which is crucial in counteracting economic crime (B. Klinger, J. Szczepański, 2017, p. 14).

With the growing digitalization of the economy, cybercrime has become one of the main threats. Criminals often exploit vulnerabilities in IT systems to commit financial fraud, extort data or steal funds. Technology plays a key role in securing systems against such attacks (Stratyński, 2015, p. 724).

Advanced cybersecurity systems, including firewalls, intrusion detection systems and data encryption, are used to protect against unauthorized access to sensitive information. Moreover, AI and machine learning are increasingly used to monitor network traffic in real time, which allows for quick detection and response to cybercriminal attacks.

Technologies such as blockchain can also help secure supply chains and online transactions, which is crucial to reducing online fraud (W. Filipkowski, 2019, p. 485).

V. Analysis of money laundering procedures and prevention systems in national and international contexts

Money laundering is a term derived from the English expression "money laundering", which dates back to the 1930s in the United States. During Prohibition, criminal groups generated huge profits from illegal production, smuggling and distribution of alcohol. The scale of these operations meant that criminals had significant financial surpluses, the origin of which they could not officially prove to the tax office. In order to legalize these funds, legal businesses were established, such as grocery stores, car washes or laundries, where it was easy to hide the actual turnover. In such places, the income from criminal activity was recorded as income from the legal sale of goods and services (M.M. Żołna, 2006, p. 12). Interest in the issue of money laundering has increased significantly, mainly due to a new approach to combating organized crime. Many years of experience have shown the ineffectiveness of a strategy based solely on criminal liability of participants in crimes. Even the imprisonment of members of criminal organizations, including those at the highest levels of the hierarchy, did not reduce the scale of the operation. Prisoners continued to manage their activities from behind bars or were quickly replaced by other members.

Currently, the strategy of combating organized crime places greater emphasis on cutting off criminal groups from sources of financing by depriving them of the fruits of crime. Such tactics significantly weaken organizations, whose functioning requires huge financial outlays on paying members, bribes and the implementation of criminal activities themselves. The key to success in combating this phenomenon is to prevent criminals from legalizing their illegal income (M.M Żołna, 2006, pp. 12-14).

The largest part of this income comes from drug trafficking, which has reached an unprecedented scale in recent years. The profits from this activity are so huge that it is becoming a problem to exchange large amounts of cash for smaller, easier to carry carriers of value, such as banknotes of higher denominations. Although other forms of criminal activity, such as human trafficking, illegal transport of hazardous waste, arms smuggling, financial fraud or smuggling of various goods, also generate millions of dollars in profits, none of these forms can match the scale of illegal production and trade in drugs.

Globalization has significantly influenced the development of money laundering. Today, in the face of the free flow of capital, goods and people, state borders are crossed not only by legal goods, tourists or employees, but also by criminals, illegal goods and "dirty" money. Recent decades have brought significant internationalization of organized crime and, consequently, money laundering. The main factor contributing to this internationalization is the increasing facilitation of international cooperation and the dynamic development of technology and information flow (M. Prengel, 2003, p. 83).

Studies of specific cases indicate that money laundering activities occur with a certain regularity, which allows them to be systematized into specific models. The aim of creating these models is to organize the operations carried out as part of this procedure. In the specialist literature on money laundering, the process is generally divided into three phases: the investment phase, the layering phase, and the integration phase. These stages are characteristic of the three-phase model, which was developed on the basis of research on money laundering, especially money laundering from illegal drug production and trade. This model is the most frequently cited and recognized in the specialist literature (M. Prengel, 2003, p. 130).

VI. Conclusions

In the face of the growing scale of economic crime and the complexity of its methods, it is becoming important to understand the mechanisms that enable effective counteracting of these phenomena. In the analyzed context, institutions such as the General Inspector of Financial Information (GIIF), the Central Anticorruption Bureau (CBA) and the European Anti-Fraud Office (OLAF) play a fundamental role in identifying, prosecuting and preventing financial fraud. Their activities, based on international cooperation and modern technologies, are an essential element in the fight against organized crime.

The effectiveness of the strategy to combat economic crime requires not only advanced legislation, but also flexibility in adapting methods to changing market conditions and technological innovations used by criminals. Combating money laundering and other forms of financial fraud is becoming a priority, especially in the context of globalization, which facilitates the movement of capital, goods and people.

Contemporary challenges in the field of economic crime therefore require an integrated approach that combines actions at the national and international level. Cooperation between institutions, exchange of information and joint educational initiatives are key to building resilience to criminal phenomena. Support for law enforcement and regulatory institutions is also necessary so that they can effectively monitor and counteract new methods of criminal activity. In summary, combating economic crime is a complex process that requires the involvement of various entities and strategies. A key element is understanding that effective prevention and intervention must be based on cooperation and innovation, as well as on continuous adaptation of activities to the dynamically changing environment. Only in this way will it be possible to limit the scale of economic crime and protect social and economic interests in an increasingly globalized world.

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