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Aspects of money laundering and terrorist financing (AML/CFT) risks in crowdfunding on the example of Poland

Abstract

Research background and purpose: Digital technologies offer tangible economic benefits but are also exposed to the risk of misuse. Crowdfunding is a special support form for business, cultural or social enterprises. Due to anonymity, fragmentation of capital and wide coverage, crowdfunding transactions are particularly vulnerable to the risk of criminal activities related to the concealment of the source of income or illegal changes of the financing objective. This article addresses the risks of money laundering and terrorism financing, particularly on the specifics of crowdfunding. Research has proposed a synthetic risk indicator for AML/CFT, which may measure the level of risk and vulnerability of crowdfunding to money laundering and terrorism financing.

Design / methodology / approach: The discussion in the article is presented against the background of a comprehensive and integrated review of literature, covering national and foreign sources. The theoretical part of the article utilizes: method of analysis and criticism of literature, analysis and synthesis, and method of analysis and logical construction. In the empirical part, to assess the level of risk and vulnerability of crowdfunding to AML/CFT risk compared to other areas, a research procedure based on the TOPSIS linear ordering method was used. The analysis covers the years 2019 and 2023.

Findings: The results of the studies show that crowdfunding is one of the most vulnerable areas at risk of money laundering and terrorism financing. The high position in the ranking in 2019 and 2023 resulted mainly from the dynamic development of the crowdfunding market in Poland, its increasing availability, a high degree of decentralization, the occurrence of cross-border transactions and the increasing diversity of platforms in their business model. Maintaining the benefits of crowdfunding requires the simultaneous implementation of effective remedies, increased campaign transparency and close cooperation with supervisory authorities and institutions combating financial crime.

Value added and limitations: The study makes an important contribution to the literature on the subject, providing information on the criminality of crowdfunding. The results of the study can be used by supervisory and regulatory authorities as a tool for shaping security in innovative segments of the financial system. The main limitation was the relatively small number of variables selected for the synthetic measure.

Keywords: *AML/CFT risk, risk management, crowdfunding, AML/CFT Risk Index, TOPSIS method*

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Classification: G2; G23; G28; G32, C44

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1. Introduction

Digital technologies currently stimulate changes in the financial market's product area. Modern solutions represent tangible economic benefits, but they are exposed to the risk of misuse. Examples include the spread of virtual assets, mobile payment platforms, and other new payment technologies, which justify a thorough identification of their vulnerability to money laundering and terrorism financing fraud. Of course, modern financial services' proven and potential benefits must remain at the forefront of all regulatory discussions (United Nations, 2023, p. 2).

Crowdfunding is a special support form for business, cultural or social enterprises. Due to anonymity, fragmentation of capital and wide coverage, crowdfunding transactions are particularly vulnerable to the risk of criminal activities related to the concealment of the source of income or illegal changes of the financing objective. Crowdfunding platforms, through which these transactions are carried out, are essential to the modern economy. They are closely related to the Internet and digital solutions (Wójcik-Czerniawska & Pohulak-Żołądowska, 2024, p. 67). In this context, particular attention should be paid to reducing the risk of money laundering and terrorism financing.

The main research objective is to analyse and assess the risk of money laundering and terrorism financing (AML/CFT) in crowdfunding in quantitative and qualitative terms. The analysis was mainly focused on the level of risk and vulnerability of crowdfunding to AML/CFT risk. The dynamics and conditions of the development of the crowdfunding market in Poland were taken into account simultaneously. Crowdfunding was combined with other selected areas, such as telecommunications services linked to mobile payments, payment services, banking, insurance or non-profit organisations, to achieve the defined objective. The TOPSIS linear adjustment method was used to arrange the areas analysed according to the AML/CFT risk level. Data for the construction of the AML/CFT risk indicator were obtained from the reports of the Ministry of Finance from 2019 and 2023.

2. Literature review

Money laundering and terrorism financing are an essential threat to the entire financial sector. Money laundering is an action designed to authenticate funds from illegal activities. It consists of placing them on the public market while covering traces of their origin (Supreme Audit Office, 2025, p. 18). According to Opitek (2020, p. 2) money laundering consists in accounting for the financial benefits of illegal activities in such a manner as to conceal their relationship with the act by which they were obtained. It

constitutes a secondary act in relation to the underlying crime. The overall model of money laundering is as follows:

- initially, illegally acquired assets are engaged in various categories of transactions to hide their true origin,
- later, “*washed*” funds are introduced into the official financial system by converting digital currencies into fiat currency and deposited in a bank account,
- The final step is to place funds in seemingly legal investments such as real estate, companies or digital tokens.

According to the International Monetary Fund (2025), terrorism financing includes the collection and processing of funds to provide resources to terrorists. While money laundering and terrorism financing differ in many respects, criminals often exploit the same loopholes in financial systems that allow them to remain anonymous and not transparent in executing financial transactions. The financing of terrorism is based on using several transactions to legalise this phenomenon, which most often include the alternative money circulation system and products and services offered by financial institutions (Chodnicka, 2015, p. 35).

Recognizing the AML/CFT phenomenon allows a closer look at the risks involved. The risks associated with money laundering and terrorism financing are defined as risks arising from a supervised sector and institution (financial/service providers) which intentionally or unconsciously legalise funds from criminal sources. They provide financial support to criminals and terrorist organisations in such manner. The risk of AML/CFT includes, inter alia, the risks arising from non-compliance with local and international rules, regulations, codes and guidelines (Financial Services Authority, 2022, p. 3). According to Arctic Intelligencer (2025), the risk of AML/CFT refers to the likelihood and potential impact of unintentional involvement or the use of active enterprises as channels for money laundering or terrorism financing. This risk is due to the possibility for the legitimate financial system or the undertaking to flow illegally obtained funds, which may appear legitimate.

The risk of AML/CFT is primarily included in the compliance or legal risk category. However, this risk may also affect many other risk categories (International Finance Corporation, 2019, p. 8). Table 1 presents the types, risk definitions, and a description of how the risk of AML/CFT can affect individual risk categories.

Table 1. Types, definitions and description of the impact of AML/CFT risk on individual risk categories

Risk	Definition	Description of the impact of AML/CFT risk
Compliance risk	Exposure to penalties, legal sanctions and material losses due to non-compliance with the applicable laws.	Failure to comply with AML/CFT regulation requirements may result in financial penalties, fines and legal sanctions. In addition, exposure to the AML/CFT risk may require multiple regulation testing.
Legal risk	It is due to the instability of legal regulations, changes in case law, failure to comply with the contract, adverse settlement of the judicial process.	Incorrect risk management of AML/CFT may result in a disadvantageous contract and criminal liability.
Business risk	Risk of loss due to adverse alterations in the business environment, adverse strategic decisions for the company, failure to take appropriate measures to respond to changes in the business environment.	Detecting a suspicious transaction and terminating a contract with a key client may result in a reduction in business activity or the need to change the company's strategy.
Credit risk	It is caused by a failure of the counterparty or borrower to repay the liability.	Failure to apply increased due diligence measures may result in a company losing its capital due to its involvement in terrorism financing.
Market risk	Risk arises from adverse market parameter changes (interest rates, exchange rates, commodity prices).	Failure to comply with AML/CFT procedures in the financial sector may deteriorate the quality of assets. This results in a reduction and higher funding costs.
Liquidity risk	The risk of failing to cover current liabilities due to insufficient funds or the inability to liquidate assets.	Financial penalties imposed for AML/CFT infringements may reduce a company's cash flow.
Operational risk	It is due to insufficient efficiency of internal processes, people, systems or caused by external factors.	Incorrect risk management of AML/CFT may lead to operational errors and losses, for instance, because the risk of AML/CFT in the recipient, the intermediary, is not identified.
Reputation risk	Risks associated with negative image perception result from suspicion of illegal business practices.	Violation of AML/CFT rules may harm the company's reputation, leading to a loss of confidence among stakeholders.
Foreign exchange risk	Risk of impairment of assets, negative carrying amount of liabilities due to alterations in exchange rates.	Violation of AML/CFT rules in foreign exchange transactions may lead to financial losses and a reduction in the value of foreign exchange assets.

Source: own elaboration based on International Finance Corporation 2019, p. 7

In the national legal system, the issue of AML/CFT risk management is standardized by the Act of 1 March 2018 on anti-money laundering and terrorism financing (the so-called AML/CFT Act). This law obligates institutions to control money laundering and terrorism financing. Institutions bound by that law are financial and non-financial entities that offer services or products that may be used contrary to their use for money laundering or terrorism financing. These entities recognise and assess the risk of AML/CFT related to business relationships with customers or occasional transactions carried out by them (Golenski, 2023, p. 113). Article 2 of the AML/CFT Act covers banks, payment institutions, investment funds, insurance companies, insurance intermediaries, merchants, notaries, lawyers, legal counsels, tax advisers, entities operating in the field of bookkeeping services, credit institutions, and traders accepting or making payments for goods in cash of a value equal to or exceeding the equivalent of EUR 10,000.

The required institution should know and understand the risk of AML/CFT to which it is exposed. The overall risk assessment must be strictly adapted to the nature and extent of the activities carried out by the undertaking. The use of general risk assessment models is not permitted without careful alignment with the business's specific and individual nature and scope. This puts the institution liable for failure to comply with its statutory obligation at risk. Importantly, even in the case of obliged institutions operating to a similar extent, it is possible to identify completely different risks related to money laundering and terrorism financing (General Inspector of Financial Information, 2022).

The effective risk management process of AML/CFT includes the following key elements (Financial Transparency Advisors GmbH, 2024):

- identification of the AML/CFT risk to which the entity is exposed, taking into account customers, services, countries of operation, and taking into account publicly available information on this risk and its typology,
- identification and application of measures and tools to successful and effective reduction and management of the AML/CFT risk,
- the implementation of policies, procedures, and systems to ensure continuous compliance and to monitor developments in the AML/CFT risk,
- documentation of the risk assessment to monitor, manage, and mitigate the AML/CFT risk.

Correctly identifying the AML/CFT risk requires understanding the mechanisms associated with this risk category. To this end, a risk-based approach (*RBA*) should be used in all areas where such risk occurs. In areas where an increased risk is detected, i.e., where an entity is more exposed to its use for removing illegal measures, effective and appropriately tailored anti-money laundering systems should be ensured. In turn, simplified procedures can be introduced where reduced risk is detected (Zielinska 2015, p. 122).

The practical and universal tool used to assess and manage the AML/CFT risk is the “*National Risk Assessment of Money Laundering and Terrorism Financing*” (NRA) together with Annex 1 to the National Risk Assessment of Money Laundering and Terrorism Financing, published by the General Inspector of Financial Information in 2023 (Ministerstwo Finansów, 2023). Those documents may be considered by the institutions required to draw up their risk assessment. In addition, the institutional aspects of risk assessment can ensure the development of risk management practices for AML/CFT.

The Polish Financial Supervision Authority (UKNF) expects that the minimum methodology standard in force in the required institution will include the following elements (UKNF 2020, p. 4):

- assessment of the inherent risk, i.e., the risk arising in the absence of action taken to reduce the likelihood of risk and/or its effects for each risk factor,
- identification of risk mitigation methods and the assessment of their effectiveness,
- an assessment of the residual risk, i.e., the risk remaining after the introduction of risk control procedures, mitigation methods, and their effectiveness,
- defining activities planned by an institution obliged to manage residual risk.

The AML/CFT policy is an essential element of risk management in the company. Failure to comply with money laundering and terrorism financing rules has serious legal and financial consequences. The only appropriate solution remains implementing an effective AML/CFT policy that allows the company to identify, assess, and mitigate the risks associated with money laundering and terrorism financing (ESG Compliance 2024). The European Banking Authority (EBA) guidelines on policies and procedures for compliance management and the role and responsibilities of the AML/CFT compliance officer clearly define the tasks to be performed to control the exposure to the risk. For instance, the AML/CFT compliance officer appointed by the management body should identify the documents planned to be adopted within the scope of the strategy and procedures counteracting money laundering and terrorism financing: define the documents scheduled for adoption, ensure their effective implementation, and regularly review and update the documentation (EBA, 2022, pp. 14-15).

The final, equally important step is documenting the AML/CFT risk assessment. It is imperative to confirm the application of financial security measures based on transaction analyses. Any action taken to implement financial security measures should be formally documented on paper or electronically to prove that statutory obligations in this respect have been performed. The results of the transaction analysis should clearly indicate the reasons for considering the client's transaction as potentially suspicious or not. Implementing the Know Your Customer (KYC) procedure is a good market practice. This procedure regulates the rules for collecting customer data and information within the framework of the financial security measures used to identify and assess customer risk (KNF 2024, pp. 7-10). Unlike simplified financial security measures, which are

voluntary, the National AML/CFT provides for an obligation to apply Enhanced Due Diligence - EDD, among others, in cases of:

- identification of higher AML/CFT risk,
- business relationships or transactions involving a third country of high risk,
- the presentation of false or stolen documents by the customer,
- complex or unusual transactions with no apparent economic purpose.

The essence of the EDD is that, in addition to standard financial security measures, an institution must implement additional, more stringent customer identification and monitoring mechanisms. Thus, EDD cannot replace standard customer due diligence measures (Dudkowiak & Putyra Business Lawyers, 2024).

The disclosure of cases of money laundering and terrorism financing in practice depends to a large extent on well-functioning cooperation between the actors in the anti-terrorism system. In addition to the obliged institutions and the General Inspector of Financial Information, the participation of entities controlling the implementation of the AML/CFT Act and cooperating entities is significant in the framework of supervision and control. It is therefore necessary to express the view that the main impact on the effectiveness of AML/CFT risk mitigation will primarily rely on the reliable identification of the client by the obliged institutions and the application of financial security measures (Golonka 2020, p. 23).

Considering the risk of using financial systems for money laundering and terrorism financing, it is particularly important to monitor modern forms of capital circulation. Alternative financing methods have been gaining popularity in recent years. Although they offer relatively high availability and flexibility, they raise doubts about transparency, control, and vulnerability to abuse. Crowdfunding is one such method.

The term crowdfunding was proposed by Michael Sullivan in 2006, according to A. Alińska (2019, p. 175) crowdfunding is a mechanism for cooperation between the Internet community, where capital is raised to finance specific projects. A. Brunello (2016, p. 27) clarifies that such projects may relate to practically any subject – from social activities to the development of innovative start-ups. The entire fundraising process is carried out through crowdfunding platforms. They are specialized online systems where collection creators can establish contacts with potential contributors (the so-called ‘crowd’). Crowdfunding, therefore, does not involve traditional financial intermediaries (Deng et al., 2022, pp. 1-2; Hoque, 2024, p. 1). This distinguishes it from other financing methods. In addition, one of the main advantages of crowdfunding was pointed out by D.T. Dziuba (2015, p. 11). He states that crowdfunding is not just a method of raising capital. He also perceives its essential role as a source of information. It can be a way of promoting and measuring the level of market interest in a project (product, service, or process). The characteristics of crowdfunding thus make it an attractive substitute and/or complement to traditional sources of financing, such as bank loans (Tian et al., 2024, p. 1).

Crowdfunding can operate on one of its four basic models: (1) donation, (2) loan, (3) investment, or (4) mixed (Dziuba, 2015, pp. 22-23; Hoque, 2024, pp. 2-3; Szopa, 2018, p. 36; Trzebiński, 2024, p. 390). Two sub-models can be distinguished within the donation model: with the awarding of participants (sponsors) and without awarding participants (charity). In the case of the first one, the donors receive a specific service. They most often include symbolic gifts. On the other hand, the charity sub-model is based on donations made by donors who do not expect anything in return. In this case, the donors act as charity donors. On the other hand, credit crowdfunding is an alternative to bank loans. Under such a model, the contributors conclude a loan agreement with the initiators of crowdfunding campaigns. In turn, the investment model assumes the acquisition by the internet community of shares or stocks in the company, searching for financing. The mixed model uses selected elements from other models (Alińska, 2019, p. 177; Dziuba, 2015, pp. 22-25; Szopa, 2018, pp. 36-37).

Crowdfunding is also one of the sub-sectors of FinTech (Folwarski, 2019, p. 76; Gibowski, 2025, p. 61). FinTech (Financial Technology) can be integrated into the subjective and objective scope. Thus, on a subjective basis, it means companies (often young start-ups) that provide products and services financed using modern technologies (Barbu et al., 2021, p. 1415; Będowska-Sjojka et al., 2023, p. 15). FinTech, on the other hand, refers to innovative technologies used to improve and automate the processes of financial services (Lahrou & Horr, 2025, p. 104). In addition to crowdfunding, FinTech also includes, among others: factoring, social commerce, robotics, personal finance, alternative payment methods, private banking, Blockchain, cryptomarkets, Internet exchanges, data analysis, online loans, search engines and comparison machines for financial services or online insurance (the so-called Insurance Technology - InsurTech) (Alińska, 2019, p. 158; Folwarski, 2019, p. 76; Gibowski 2025, p. 61).

Crowdfunding, like virtual assets, has become an attractive alternative to private investors to provide financing, often in the face of financial exclusion and/or unreliable banking systems (United Nations, 2023, p. 3). As a form of crowdfunding, it uses digital technologies that drive changes in how it interacts with the financial system. Introduced technological innovations offer many economic opportunities for crowdfunding participants, with increasing transaction efficiency. However, the relatively easy availability of crowdfunding for many different types of entities may carry a high risk. We are talking, above all, about possible economic crimes committed through this process. They include the abovementioned actions, such as money laundering or financing terrorism. The Polish Ministry of Finance, in Annex 2 to the report "National Risk Assessment of Money Laundering and Terrorism Financing" published in 2023, pointed to potential scenarios of the role of crowdfunding in such crimes. In the case of money laundering, crowdfunding may constitute a mechanism for raising funds for launching legal businesses. However, such financial measures may come from criminal activities and may be paid by impostors or fictional natural persons. Another method

is to use crowdfunding platforms to transfer funds derived from unauthorised use of payment cards. They are paid or transferred to subsequent bank accounts. Regarding terrorism financing, the Ministry of Finance pointed towards three main risk scenarios. The first is to use crowdfunding to organise money collections, aiming to support terrorism. However, the official purpose of such a collection does not indicate such intent. Supporters of terrorist organisations may also issue information about such collections through social media. The third scenario implies using donation crowdfunding to carry out this crime. Knowing the criminal nature of the collection, the donors may contribute to donations that are officially concerned, e.g., the publication of a literary work. For the effective prevention of criminal activities through crowdfunding, it seems crucial to determine its vulnerability and threat to such activities (Ministerstwo Finansów, 2023, pp. 146-152). It is also essential to introduce and update relevant legislation at the EU and national levels.

In addition to the AML/CFT Act cited above, the risk of crowdfunding being used for criminal activities also limits the provisions of the Polish Act of July 7, 2022, on crowdfunding for business ventures and assistance to borrowers. It introduces comprehensive regulations in the area of credit and investment crowdfunding. Firstly, it adapts Polish law to EU rules on crowdfunding. It establishes, inter alia, an obligation for crowdfunding platforms to obtain permission from the Financial Supervision Authority (KNF). It also introduces a responsibility to keep accounts and audit accounts by crowdfunding service providers and sets standards for communication with investors. In addition, the organisation of crowdfunding campaigns by limited liability companies has been prohibited since November 2023. Administrative, civil, and criminal liability is provided in case of a breach of the provisions of the Act.

In the case of money laundering, the most effective method for criminals is crowdfunding in the form of centralised or peer-to-peer loans (P2P). In the first case, the crowdfunder lends money to individuals or companies in exchange for interest. Although there are platforms aimed exclusively at socially-oriented loans, most operate for profit and compete in the market with other financial intermediaries. The budget of such an entity may, in part, be based on funds from an illegal source, which are further used for the provision of online loans under favourable conditions (Opitek, 2020, p. 11).

A.A. Trzebiński researched the state of the crowdfunding market in Poland. In his reports prepared in the framework of cooperation between the Association of Financial Enterprises in Poland and the University of Economics in Wrocław, he analysed the entity structure and the relevant investment and donor crowdfunding markets and the changes within them. The results of his research indicate that in 2023, 22 companies managed to obtain nearly PLN 20 million in cooperation with platforms operating based on the investment model. The total size of the investment crowdfunding market was estimated at PLN 316 million. This means an increase of 6.7% compared to 2022.

In a report for 2022, he reported that according to his estimates in 2008-2022, Polish crowdfunding platforms operating based on the donor model collected a total of PLN 3.5 billion. He is named Siepomaga.pl, the leader of crowdfunding campaigns in Poland. By 2022, over 2 billion zlotys were collected through the platform. This gave it a market share of 61% in donor crowdfunding. However, A.A. Trzebiński, in any of his reports, estimated the size of the entire crowdfunding market in Poland (Trzebiński, 2022, 2023).

The issue of the risk of crowdfunding being used in terrorist financing processes has been analysed by the Financial Action Task Force (FATF) (FATF 2023). The report entitled “*FATF REPORT Crowdfunding for Terrorism Financing*”, published in 2023, indicates that terrorist groups and extremists have used crowdfunding platforms, social media and cryptocurrency payments to raise funds. The most common abuses included: impersonating charitable fundraising, using platforms that circumvent supervision, exploiting social media algorithms to increase reach, and using tools to increase the anonymity of transactions. The lack of consistent AML/CFT regulations and insufficient risk assessment in many countries further exacerbate these risks. The FATF’s conclusions are the result of desk research, a questionnaire addressed to the FATF Global Network, information obtained from FATF members and observers, academia, think tanks and the private sector. The results of the analyses conducted on a global scale clearly indicate a growing risk of crowdfunding mechanisms being used for criminal activities. These findings form an important theoretical and methodological foundation for moving from an international perspective to an assessment of risk and vulnerability at the national level, taking into account the specificities of local regulatory, institutional and market conditions. So far, only the Ministry of Finance has undertaken a detailed analysis of the crowdfunding market in Poland regarding the risk associated with using it for money laundering and terrorism financing. However, these measures were mandatory and stemmed from legal regulations. However, in the reports titled “*National Risk Assessment of Money Laundering and Terrorism Financing*,” the AML/CFT risk is analysed separately. So far, a synthetic indicator that indicates the risk level for crowdfunding for criminal activities has not been developed. The reports also do not provide detailed information on the conditions and dynamics of the crowdfunding market development in Poland. This aspect is crucial to understanding the scale of the hazard under examination. This study aims to complement the identified research gap.

3. Research methods

Data published by Cashless.pl in the publications titled “*Map of Polish Fintech*” will be used to determine the size of the entire crowdfunding market in Poland. These reports have been published regularly since 2018. The number of Polish crowdfunding platforms

developed between 2019 and 2023 will be adopted as the measure of the development of this market. Currently, data on the size of the entire crowdfunding market in Poland is unavailable. In addition, data from the Polish Statistics Poland on crimes committed in Poland was also considered.

The risk indicator of AML/CFT will be adopted as a measure of risk to crowdfunding for money laundering and terrorism financing. Data for the indicator were collected from the Ministry of Finance reports from 2019 and 2023. They come from a survey addressed to institutions under obligation and supervisory authorities, i.e., law enforcement authorities and other cooperating bodies. These entities were asked to provide information related to the issues of counteracting money laundering and terrorism financing. The Ministry of Finance received responses from 821 entities in the 2023 survey edition¹ (i.e., more than 558 compared to the previous edition). Most of the surveys came from institutions under such obligation (658). The entities covered by the study identified, among other things, financial products and services which, in their opinion, could most often be related to money laundering and terrorism financing.

The synthetic risk indicator of AML/CTF will be determined based on the TOPSIS linear cleaning method (acronym from *The Technique for Order of Preference by Similarity to Ideal Solution*). This method is a technique often used to create extended rankings of multi-feature objects, including: economic security (Borkowski 2019), financial viability and public security dynamics (Skrzyński & Wasiuta, 2025), or the issue of money laundering (Geneviciene et al., 2024). Developed by Hwang and Yoon (1981), the TOPSIS method allows for determining the distances selected for testing objects from the so-called ideal solution (pattern) and anti-ideal solution (anti-pattern). Linear ordering of objects is carried out based on the results obtained. The ranking leader is considered an object at the lowest distance from the theoretically ideal solution and at the same time the farthest from the anti-ideal solution. The perfect solution is an object with the highest values for stimulants and the lowest values for de-stimulants. The variables for the anti-ideal solution accept the lowest values for the variable stimulant and the highest for the variable de-stimulant (Karim & Karmaker, 2016; Zalewski, 2012).

One of the most critical steps in building the ranking based on the TOPSIS method is the selection of variables. In such a case, they will come from reports titled “*National Risk Assessment of Money Laundering and Terrorism Financing*” from 2019 and 2023. They include²:

1 Data were collected since the second half of July 2021.

2 Four variables were selected because they are the only AML/CFT risk indicators provided by the Ministry of Finance. No other measurable, reliable, comparable or up-to-date data is available for the financial sectors surveyed that would allow them to be included in the analysis. Therefore, limiting the number of variables to these four allows for the reliability and comparability of the results to be maintained, basing the ranking on official and up-to-date data.

- X1 – Averaging susceptibility to money laundering,
- X2 – Averaging risk associated with the use of money laundering,
- X3 – Averaging vulnerability to terrorism financing,
- X4 – The average risk level associated with using terrorism financing.

In accordance with the methodology adopted by the Ministry of Finance (Ministerstwo Finansów, 2019; 2023), the values for average susceptibility and the level of threat are between 1 and 4, where:

- 1 is a low risk/low susceptibility,
- 2 – average risk/average susceptibility,
- 3 – high risk/high vulnerability,
- 4 – very high risk/very high susceptibility.

The selection of variables was due to their relevance in the context of the phenomenon under examination and the quality and availability of data. According to statistical criteria, variables should be characterised by high variability (i.e., the coefficient of variation for each characteristic should be higher than 10%) and a low correlation (i.e., the absolute value of Pearson's correlation ratio should not exceed 0,7) (Kukuła, 2000; Strahl, 2006; Zeliaś, 2002). The initial condition is met for all variables. The second variable was not met in the case of a single variable pair (i.e., X1 and X3). However, due to the limited number of variables and their highly justified choice in substance, four variables were considered to create the ranking.

It is assumed that a *k*-element set of objects is considered (in the analysed case, 4 categories of threat), considering *m* variables (the level of threat). As a result, the data matrix *X* [*k* x *m*] was obtained. The TOPSIS method requires the following stages (Borkowski, 2019; Chakraborty, 2022; Zalewski, 2012):

1. Standardization of data from matrix *X* to ensure comparability of indicators (formula 1):

$$Z_{ij} = \frac{x_{ij}}{\sqrt{\sum_{i=1}^k x_{ij}^2}} \quad \text{for } i = 1, 2, \dots, k \text{ and } j=1, 2, \dots, m \quad (1)$$

2. Assignment of weights³ for individual variables according to formula 2:



³ Each variable was assigned equal weight (0.25). The use of equal weights results from the fact that the final values of individual variables, published by the Ministry of Finance (Ministerstwo Finansów, 2019, 2023), already take into account their internal diversity and substantive significance. Re-differentiating the weights would lead to artificial distortion of the results and disrupt the analysis. The detailed research methodology is included in Annex 1 to the National Risk Assessment of Money Laundering and Terrorism Financing.

$$v_{ij} = w_j^4 * Z_{ij} \quad \text{for} \quad i = 1, 2, \dots, k \text{ and } j=1, 2, \dots, m \quad (2)$$

3. Determination of variable values for ideal a^+ and anti-ideal solutions a^- :

$$a^+ = [v_1^+, v_2^+, \dots, v_m^+] \quad (3)$$

$$a^- = [v_1^-, v_2^-, \dots, v_m^-] \quad (4)$$

where:

$$v_j^+ = \begin{cases} \max(v_{ij}) & \text{when characteristic } j \text{ belongs to the stimulants collection} \\ \min(v_{ij}) & \text{when characteristic } j \text{ belongs to the destimulants collection} \end{cases}$$

$$v_j^- = \begin{cases} \min(v_{ij}) & \text{when characteristic } j \text{ belongs to the stimulants collection} \\ \max(v_{ij}) & \text{when characteristic } j \text{ belongs to the destimulants collection} \end{cases}$$

4. Determination of the distance of Euclidean objects from the ideal a^+ and anti-ideal a^- (formulas 5 and 6):

$$d_i^+ = \sqrt{\sum_{j=1}^m (v_{ij} - v_j^+)^2} \quad \text{for} \quad i = 1, 2, \dots, k \text{ and } j=1, 2, \dots, m \quad (5)$$

$$d_i^- = \sqrt{\sum_{j=1}^m (v_{ij} - v_j^-)^2} \quad \text{for} \quad i = 1, 2, \dots, k \text{ and } j=1, 2, \dots, m \quad (6)$$

5. Determination of a synthetic indicator that determines the similarity of the object to the ideal solution (formula 7):

$$q_i = \frac{d_i^-}{d_i^+ + d_i^-} \quad \text{for} \quad i = 1, 2, \dots, k \quad (7)$$

The coefficient may take values from the range [0,1]. The closer the coefficient value is to 1, the closer the object is to the ideal/formulaic solution.



4 Where w_j is the weight of the j th criterion, where $w_j \in [0,1]$ and $\sum_{i=1}^k w_j = 1$.

Objects accepted for the study can be further grouped in terms of the level of development of the subject under examination. This is typically done using the arithmetic mean and the standard deviation derived from the synthetic indicator. The following groups can be distinguished on the basis (Borkowski, 2019; Ertman, 2011; Hajduk & Jelonek 2021):

- I – objects with the highest indicator level ($q_i \geq \bar{q} + S_q$),
- II – objects with high indicator level ($\bar{q} \leq q_i < \bar{q} + S_q$),
- III – with low indicator level ($\bar{q} - S_q \leq q_i < \bar{q}$),
- IV – objects with the lowest indicator level ($q_i < \bar{q} - S_q$),

where:

- arithmetic mean of the synthetic indicator,
- standard deviation of the synthetic indicator.

4. Results and discussions

To comprehensively present the issues related to AML/CFT risk in crowdfunding, it is necessary to analyse selected parameters characterizing the indicated source of funding in Poland. One of the key elements of such analysis is the assessment of the dynamics of the industry in question, which captures the changing scale of operations of the entities in the sector. The change in the number of crowdfunding platforms can significantly affect the risk associated with fraud, including money laundering and terrorism financing. Figure 1 presents changes in the number of active Polish crowdfunding platforms in 2019-2023. This is an essential benchmark for further assessing AML/CFT risk in crowdfunding.

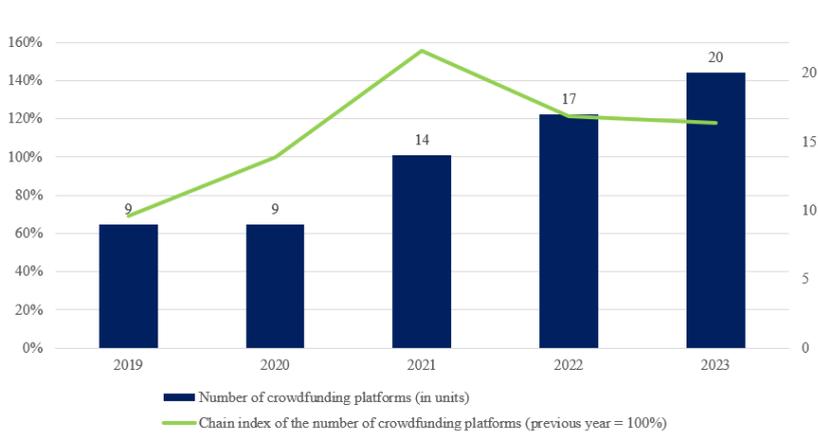


Figure 1. The number of crowdfunding platforms in Poland from 2019 to 2023

Source: own development based on the data of Cashless.pl

Polish crowdfunding platforms increased from 9 to 20 between 2019 and 2023. This is more than a double increase. This trend was the result of several systemic and socio-economic factors. The COVID-19 pandemic played a key role, as it significantly accelerated the digitalisation of the economy in 2020-2021 and promoted the use of online financial services. Under conditions of increasing market uncertainty, individuals and businesses began to seek out more flexible and accessible sources of funding. One of them is crowdfunding. It offers quick access to funds without complying with strict requirements. This was particularly important for start-ups and micro- and small enterprises. With the growing number of successful campaigns, the legitimacy of crowdfunding as an effective method of raising capital grew in parallel. This encouraged further crowdfunding providers to set up new platforms. The dynamic development of the FinTech sector and relatively low entry barriers further encouraged the growth of crowdfunding initiatives in Poland. The Act on crowdfunding for business projects and assistance to borrowers of 7 July 2022 also became applicable during the period under consideration. This act complements the EU rules on crowdfunding. The aim of these regulations is primarily to increase the safety of crowdfunding market participants.

Figure 2 presents the structure of crowdfunding platforms relevant to the subject under consideration for the years 2019 and 2023. This comparison allows us to see changes in the dynamics of the development of individual models and may indicate the evolution of the preferences of crowdfunding market participants.

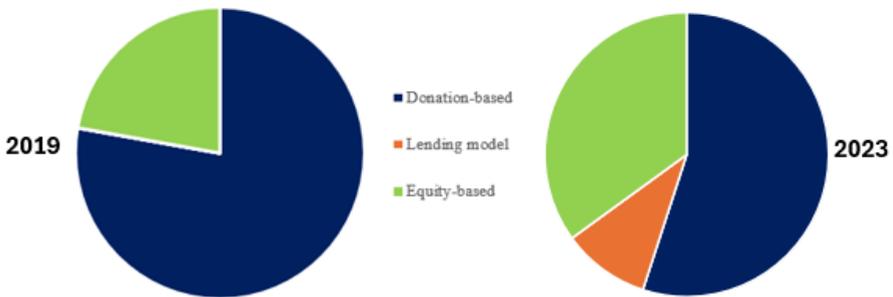


Figure 2. **Crowdfunding platforms' structure due to the model in 2019 and 2023**

Source: own development based on the data of Cashless.pl

From 2019 to 2023, significant changes have been made in the structure of crowdfunding platforms in Poland. The donation model dominated in 2019. It

was based on 7 out of 9 active platforms. This resulted in a 75% share of donation-based crowdfunding. The investment model was selected by two platforms (22% of the total)—none of the platforms operated based on the loan model. In 2023, the structure of the model was clearly diversified. The share of the donor model in the crowdfunding market, albeit still the highest, decreased to 55% (11 out of 20 platforms). The greatest was recorded in the case of an investment model whose market share increased to 35% (7 out of 20 platforms). The loan model increased its market share to 10% (2 out of 20 platforms). This confirms the expansion of the spectrum of crowdfunding applications. These changes suggest a gradual increase in the professionalism of the crowdfunding market and an increase in the importance of investment instruments in its structure.

The AML/CFF risk assessment in crowdfunding requires not only an analysis of the internal mechanisms of the functioning of this market, but also taking into account the broader context of crime in Poland. In particular, it is essential to identify trends in crime that can generate funds from illegal sources that are potentially placed on the legal market, inter alia, through crowdfunding platforms. For this purpose, data on the number of offences identified by the police were provided in completed investigations by type of criminal offence in 2019-2023 (Figure 3). This information allows for determining the dominant areas of criminal activity and assessing how they may affect the crowdfunding area's AML/CFT risk level.

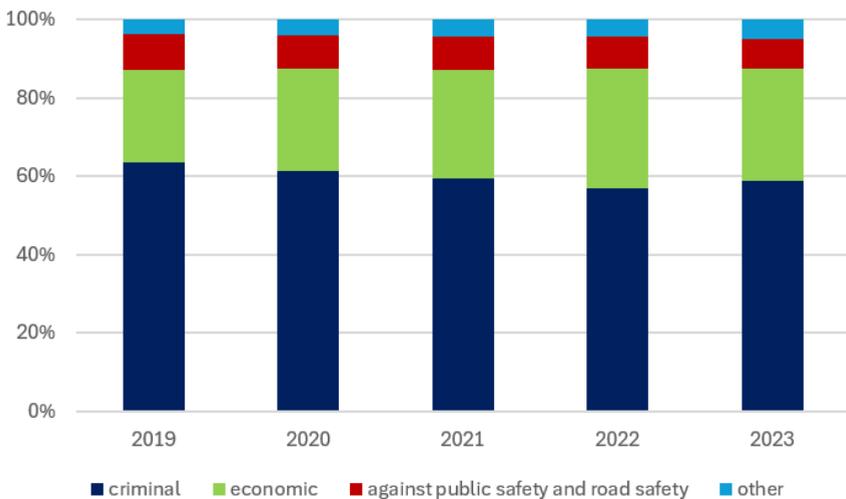


Figure 3. Crimes reported by the police in completed pre-trial proceedings by type of crime in 2019-2023 in Poland

Source: own development based on data of the Statistics Poland

Data on crimes identified by the police in completed preparatory proceedings in Poland in the years 2019-2023 indicate that the dominant category constituted criminal offences. Economic offences were the second largest share of the category (from 23.5% in 2019 to 30.6% in 2022). The upward trend in financial crime is essential from the AML/CFT risk perspective. Economic offences often involve the circulation of funds derived from fraud, embezzlement or illegal economic activities. Crowdfunding platforms can be a potential money laundering channel. A relatively high share of economic crime in the overall crime structure can signal that anti-money laundering mechanisms should be strengthened outside the classical financial sector. Also in the area of crowdfunding.

In order to properly assess the risks associated with money laundering and terrorism financing in crowdfunding, it is worth referring to the data contained in the official national risk assessment reports of AML/CFT published by the Ministry of Finance. So far, only the Ministry of Finance (Ministerstwo Finansów, 2019; 2023) has undertaken a quantitative assessment of crowdfunding in Poland in terms of AML/CFT risk. However, the results presented did not allow for a comprehensive assessment of the issue under study. The calculated variables concerned specific areas of the analysed risk. Table 2 compares the value of the synthetic AML/CFT risk indicator in selected areas for 2019 and 2023 (equivalent to the yearbooks of the aforementioned reports). This enables crowdfunding to be positioned against other sectors potentially exposed to criminal exploitation.

In 2019 and 2023, the area most vulnerable and at AML/CFT risk was the physical transfer of monetary assets across the border. This may result in difficulties in adequately supervising cross-border cash flows and valuable items. This area remains an attractive method of concealing illegal income. Payment services offered by institutions other than banks were placed second on the list for both years. This area remains central to supervisory authorities due to their flexibility, innovation, and lower regulation than the traditional banking sector. These services are most often automated and provided online. This limits the possibility of applying effective financial security measures.

Table 2. Synthetic risk indicator of AML/CFT in selected areas in 2019 and 2023

No.	2019			2023			Amendment of position 2023/2019 (number of positions)	
	Group	Area	AML/CFT risk indicator	Group	Area	AML/CFT risk indicator		
1	I	Physical transfer of property across the border	0.784	I	Physical transfer of property across the border	0.852	=	
2	II	Payment services (offered by entities other than banks)	0.600		Payment services (offered by entities other than banks)	0.645	=	
3	II	Crowdfunding	0.578	II	Virtual currencies	0.616	5	
4		Non-profit organisations	0.526		Banking	0.553	2	
5		Telecommunications services related to mobile payments	0.513		Crowdfunding	0.504	2	
6		Banking	0.484		Non-profit organisations	0.439	2	
7		Economic activity (general)	0.474		Economic activity (general)	0.435	=	
8		Virtual currencies	0.473		III	Telecommunications services related to mobile payments	0.407	3
9		Currency exchange	0.414			Currency exchange	0.361	=
10	High-value goods dealers	0.309	High-value goods dealers	0.316		=		
11	IV	Gambling	0.159	IV	Insurance	0.173	1	
12		Insurance	0.107		Gambling	0.145	1	
13		Other financial institutions	0.075		Other financial institutions	0.042	=	

Source: own elaboration based on data from the Ministry of Finance (Ministerstwo Finansów, 2019; 2023)

Crowdfunding deserves particular attention. This area fell by only two positions compared to 2019 in the 2023 ranking. In both years, it was thus included in five places at the highest risk of AML/CFT (II group, i.e., high AML/CFT risk group). That is due to the development of the crowdfunding market in Poland, its growing availability, high degree of decentralisation, and the increasing diversity of platforms due to their business model. In the AML/CFT risk context, these conditions could facilitate both classic money laundering schemes and financing terrorist activities. At the same time, crowdfunding often operates in cross-border cash flows. This complicates the monitoring process and makes it difficult to identify actual beneficiaries. The lack of a uniform reporting standard and insufficient use of participants' identity verification mechanisms have made crowdfunding platforms a relatively straightforward tool for criminal activities. A significant risk factor is the relatively high ease with which the crowdfunding campaign could launch. In conjunction with the lack of complete transparency on the subsequent use of the funds collected, this created an environment vulnerable to fraud.

Non-profit organisations recorded a decline in the ranking. Such entities, even though they usually work for charity purposes, can still be perceived as a potential tool for transferring funds of illegal origin. However, their importance in this context seems to be gradually decreasing. Similarly, telecommunications services related to mobile payments have fallen in the ranking, which may suggest improving surveillance mechanisms or shifting attention to other areas more vulnerable to abuse. These losses indicate that the risks associated with these areas may have been partially reduced or dominated by other, more risky areas of activity.

Classic banking recorded an increase in the ranking by two items, which may indicate the continued vulnerability of this sector to the AML/CFT risk, despite long-term investments in compliance systems, KYC procedures, and reporting mechanisms for suspicious transactions. This may include the complexity of banking activities and an extensive network of supported customers. Similarly, a significant increase in the ranking was recorded in the case of virtual currencies (by five items). This increase may be due to the dynamic development of innovative technological solutions and the emergence of significant regulatory and supervisory challenges. Despite implementing the rules on registration and identification obligations for virtual assets service providers, the effectiveness of such activities may be limited by the global nature of the cryptocurrency market.

Some areas, such as economic activities in general, currency exchange, or high-value goods trade, have maintained equal positions in both years. This may indicate relative stability in assessing their risks or the absence of significant systemic changes in these areas. In 2019 and 2023, insurance, gambling, and other financial institutions (IV group, i.e., low-risk group AML/CFT) were included at the end of the ranking. This indicates a relatively limited possibility of using them for money laundering and terrorism financing.

Crowdfunding was therefore characterised by a higher level of decentralisation and a relatively minor degree of regulation and institutional supervision. The lack of uniform safety standards has often prevented platforms from implementing identity verification mechanisms for donors and initiators of crowdfunding. Such a situation was conducive to creating seemingly legal campaigns that could serve illegal purposes. As a result, despite its advantages as a tool to support innovative projects and social activities, crowdfunding held a high position in the ranking of AML/CFT risk. This requires the implementation of adequate remedies, greater financial transparency of the campaign, and cooperation with supervisory authorities and anti-financial crime institutions. The results at the national level therefore confirm the FATF (2023) conclusions on the significant importance of crowdfunding as an AML/CFT risk area, with this risk in Poland stemming in particular from limited supervision and a lack of uniform security standards.

The AML/CFT risk assessment complements the presentation of which products and services offered outside the financial market are or can most frequently be used for money laundering and terrorism financing. The institutions under obligation and cooperating institutions expressed their opinions (Table 3).

Table 3. Products and services offered outside the financial market, indicated by institutions under obligation and cooperating institutions as risky areas in the context of AML/CFT in 2023

Products and services offered outside the financial market	Institutions' indications (the percentage of the number of indications in the total number of indications)	Indicators by the cooperating institutions (percentage proportion of the number of indications in the total number of indications)
Games on machines, online gambling, casino chips purchase/sales, betting, poker, and other similar types of games, and other random games	31.59	23.63
Trade in antiques and works of art, purchase/sale of real estate, purchase/sale of gemstones and precious metals, trading in other high-value goods, e.g., cars, boats	15.98	25.44
Crypto-currencies	13.11	9.09
Non-profit activities (foundations, associations)	13.11	4.55
Physical transfer of monetary assets across the border by natural persons, imports/exports of goods and services, cargo services, courier and postal packages	10.25	8.19

Business entities based in so-called tax or financial havens, companies that do not conduct business activities (fake businesses)	9.17	13.63
Crowdfunding	3.15	4.55
Rapid orders for digital wire transfers (e.g., TransferGo), Telecommunication services for premium paid numbers (premium services), centralized exchangeable currencies used for transfers of financial assets (e.g., Webmoney, Perfectmoney)	1.29	5.46
Agreements for donations	0.93	0.91
Other non-financial products and services	0.64	2.73
Trusts, business creation, services related to establishing and managing businesses and trusts	0.50	1.82
Accounting services, services provided by lawyers, legal advisers, and notaries	0.28	0.00

Source: own elaboration based on: Ministry of Finance (Ministerstwo Finansów, 2023, pp. 242-243)

In AML/CFT, obliged and cooperating institutions most frequently indicated gambling (31,59% of obliged institutions and 23,63% of cooperating institutions). In the respondents' opinion, this reflects their high potential to hide the illegal origin of funds. Trading in luxury goods was also often pointed out (e.g., antiques, works of art, precious metals), cryptocurrencies, and activities of non-profit organisations, which usually operate in models based on limited financial transparency.

Crowdfunding was indicated relatively rarely compared to other categories. It was recognised as an AML/CFT risk area by 3.15% of the institutions under obligation and 4,55% of the cooperating institutions. Although these values are relatively low compared to other categories, their presence in the set confirms that crowdfunding is perceived as potentially vulnerable to illicit use. It is also worth noting that both groups of respondents have distinguished crowdfunding. This may indicate an increasing awareness of the risks associated with such financing. Its presence in the set of risky non-financial products and services regarding AML/CFT suggests the need for further monitoring and clarification of regulations in this area.

5. Conclusions

Crowdfunding is an essential segment of the modern financial market, which, due to its specific characteristics, is exposed to significant risks related to money laundering

and terrorism financing. The differentiated structure of the models of action or the presence of cross-border transactions determines the increased risk of using these platforms for criminal purposes. Unlike financial institutions subject to strict legal regulations, crowdfunding platforms often fail to implement adequate procedures for customer identification and monitoring transactions, creating gaps in the AML/CFT risk management system.

Strengthening the regulatory framework and standardising anti-money laundering and terrorism financing practices in crowdfunding is necessary. Particular attention should be paid to cooperation between market players, supervisors, and services related to counteracting financial crime. This is a key element of effective AML/CFT risk mitigation. In addition, it is necessary to increase the financial transparency of the activities carried out and develop mechanisms for identifying and verifying crowdfunding market participants.

In the area of future research, it is crucial to systematically monitor the effectiveness of the regulations implemented and to assess the effectiveness of the preventive measures applied. The diversity of crowdfunding models and the associated varying levels of AML/CFT risk should be taken into account. In addition, it is advisable to conduct comparative studies with other countries in order to identify good regulatory practices or to take into account additional risk variables, such as the type of crowdfunding projects or the profile of donors. Future research should also address the potential of modern technologies (e.g. artificial intelligence or Big Data) to improve the financial security of crowdfunding transactions and increase compliance with anti-money laundering and counter-terrorist financing requirements.

Authors' contribution

K.Ł. and Ł.G.: article conception, theoretical content of the article, research methods applied, conducting the research, data collection, analysis and interpretation of results, draft manuscript preparation.

Declaration of Generative AI and AI-assisted technologies in the writing process

While preparing this work, the authors did not use any tool/service.

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