Financial Secrecy vs Anti-Money Laundering: Legal and Regulatory Dimensions in a Digitally Driven Global Environment

Olha Kovalchuk[1], Nataliia Holota[2], Iryna Svitlak[2], Serhiy Banakh[3] and Viktor Ivchuk[4]
[1]*Theory of Law and Constitutionalism Department, West Ukrainian National University, Lvivska Str. 11, 46009 Ternopil, Ukraine*
[2]*Department of Law and Humanities, Vinnytsia Education and Research Institute of Economics, West Ukrainian National University, Ghonty Str. 37, 21017 Vinnytsia, Ukraine*
[3]*Department of Criminal Law and Process, West Ukrainian National University, Lvivska Str. 11, 46009 Ternopil, Ukraine*
[4]*Department of Management and Administration of the Communal Higher Educational Institution "Vinnytsia Academy of Continuous Education", Hrushevskoho Str. 13, 21050 Vinnytsia, Ukraine*
o.kovalchuk@wunu.edu.ua, n.golota@wunu.edu.ua, svitlakiryna@gmail.com, s.banakh@wunu.edu.ua, ivchuk1307@ukr.net

Keywords: Security, Economic Openness, Anti-Money Laundering, Corruption, Financial Secrecy, Public Policy, Legal Regulation, Government Regulation, Global Dimension, Interdisciplinary Approach.

Abstract: This research examines the relationships between money laundering risks and financial secrecy levels across different global jurisdictions to formulate proposals for developing effective regulatory policies in the field of financial transparency. To achieve this objective, an interdisciplinary approach was employed, involving a comparative analysis of the Basel AML Index (AMLI) and the Financial Secrecy Index (FSI) for 109 jurisdictions. Visual spatial analysis and multidimensional correspondence analysis were performed using Statistica and RapidMiner statistical packages. A statistically significant relationship was identified between the studied indices ($\chi^2 = 16.73$, $p = 0.04$). Three primary dimensions of interaction were distinguished, explaining 99.9% of the total system inertia. It was established that the categories "low FSI" (31%) and "very high AML" (30%) make the greatest contribution to overall variability. A latent inverse relationship was identified between the highest money laundering risks and the lowest level of financial secrecy, along with associative relationships between medium levels of AMLI and FSI. The unique positioning of jurisdictions with the highest financial transparency was established, which are not associated with any AML categories. It was concluded that the complex nonlinear structure of associations between the studied phenomena requires differentiated approaches to international legal regulation and public administration of financial transparency, taking into account the specific characteristics of national anti-money laundering regimes and legal systems. International organizations can utilize the obtained results to enhance financial risk assessment systems, by national regulators to tailor anti-money laundering legislation to jurisdictional specifics, and by financial institutions to develop more effective compliance control systems and reputational risk management strategies.

1 INTRODUCTION

In the modern interconnected world, the issue of financial transparency has gained critical importance for effective government regulation and public administration. According to estimates by international experts, the volume of money laundering in 2024 ranges from 2.22 to 5.54 trillion US dollars, representing approximately 2–5% of global GDP [1]. This amount passes through the global financial system undetected annually and creates serious challenges for national governments and international organizations in developing effective strategies to combat financial crimes [2], [3].

The paradox of the current situation lies in the fact that despite active efforts by the international community, methods of laundering proceeds from criminal activity are constantly evolving [4]. Criminals use alternative laundering channels in response to the implementation of the Financial Action Task Force (FATF) standards [5] by the

international financial sector. Simultaneously, there is a significant increase in the use of virtual assets in fraud and money laundering schemes [6]. In 2024, illegal activity on blockchain is estimated at approximately 51 billion dollars [7]. In 2022, the United States of America topped the Financial Secrecy Index (FSI) ranking for the first time, surpassing traditional financial centers such as Switzerland and Singapore [8]. This fact changed established perceptions about the geography of financial secrecy and demonstrated that even countries with developed legal regulatory systems can create favorable conditions for asset concealment [9].

Public policy in the field of financial transparency faces complex challenges when it is necessary to balance the requirements of national security, economic competitiveness, and international cooperation. According to Tax Justice Network data, countries worldwide annually lose 492 billion dollars in tax revenue through the use of tax havens by multinational corporations and wealthy individuals [10]. The problem is complicated by the fact that as of 2024, only 33 jurisdictions with significant virtual asset service provider activity are fully or largely compliant with FATF standards, compared to 25 jurisdictions in 2023 [11]. This indicates slow rates of adaptation of national legal systems to the challenges of the digital economy.

International organizations, particularly FATF, continue to improve their approaches to assessing the effectiveness of national anti-money laundering regimes. The Financial Crimes Enforcement Network (FinCEN) regularly informs American financial institutions about updates to the lists of jurisdictions with strategic deficiencies in systems for combating money laundering, terrorism financing, and weapons of mass destruction proliferation [12]. However, the effectiveness of these measures remains a subject of discussion among experts and practitioners.

The results of previous scientific research indicate that regulatory and social factors influence illicit financial flows more than economic factors [13], which confirms the complexity of these relationships. Specifically, the USA received a critical assessment from FATF in 2006 regarding the effectiveness of anti-money laundering efforts, and subsequently topped the FSI [14], which demonstrates the paradoxical relationship between anti-money laundering mechanisms and levels of financial secrecy. Recent analytical studies conducted in [15] revealed an almost 100% correlation between low-risk countries for money laundering and environmental crimes. This suggests the possible existence of hidden structural patterns. Identification of these mechanisms is extremely important for developing scientifically grounded approaches to international policy coordination and forming differentiated public administration strategies in the field of financial security. Currently, a generally recognized effective tool for assessing policy achievements worldwide is the FSI. It provides the ability to determine countries' efforts in developing policies to prevent concealment and laundering of funds by wealthy individuals and criminals [8]. At the same time, one of the most authoritative tools for assessing money laundering risks at the national level remains the Basel AML Index (AMLI) [16].

Contemporary geopolitical transformations and economic challenges caused by the increase in regional military conflicts and sanctions policy have actualized the issue of effective government regulation of financial flows [17]. Countries are forced to reconsider their approaches to balancing economic openness and security, which necessitates conducting a comprehensive analysis of the relationships between different aspects of financial transparency and money laundering risks to form a well-founded state anti-corruption policy. Analysis of these complex relationships can provide an empirical foundation for developing more effective international cooperation strategies and help governments of various countries form differentiated approaches to the legal regulation of financial transparency, as well as develop effective anti-money laundering strategies that consider the specific characteristics of their national financial systems and geopolitical positions.

The purpose of this research is to identify statistical relationships between AMLI and FSI across 109 jurisdictions using correspondence analysis. We hypothesize that these relationships have a complex multidimensional structure characterized by non-linear associations between different risk and secrecy categories, where extreme values of one index do not necessarily correspond to extreme values of the other. Accordingly, the research addresses the following tasks: testing the statistical significance of AMLI-FSI associations, identifying the dimensional structure of their interactions, and determining the spatial positioning patterns of different jurisdiction categories in the correspondence.

2 METHODOLOGY

To investigate the correlation between threats of money laundering and the degree of confidentiality of financial operations in different jurisdictions worldwide, a comparison of AMLI [16] and FSI [8] was conducted for 109 jurisdictions for which values of both indicators are known. AMLI varies from 0 to 10 (where higher values indicate greater risks). It assesses the threat of money laundering and terrorism financing based on the quality of anti-money laundering measures, political and legal risks, as well as financial standards and compliance with international FATF recommendations [12]. FSI is measured from 1 to 141 (higher values correspond to greater secrecy) and considers the level of banking secrecy, corporate transparency, international cooperation in tax matters, and availability of information about beneficial owners, which directly depends on national legislation and its practical implementation. Comparison of these indices allows for identifying gaps in legal regulation and assessing how closely deficiencies in legislative frameworks of financial transparency are related to risks of using financial systems for illegal purposes.

The first stage of our research involved conducting a visual analysis of the spatial distribution of AMLI and FSI for countries included in these rankings. In the second stage, we applied correspondence analysis to identify significant non-obvious relationships between money laundering risk categories and financial secrecy levels in different groups of jurisdictions. This allowed us to reveal statistically significant patterns that are not obvious when visually examining the spatial distributions of the indices.

Correspondence analysis is a multidimensional statistical method designed to investigate relationships between categorical variables through their graphical representation in Euclidean space [18].

The main estimates of the method are:

- Chi-square test determines the statistical significance of the relationship between variables:

$$\chi^2 = \frac{(O-E)^2}{E}, \quad (1)$$

where O – observed frequencies, E – expected frequencies.

- Mass characterizes the relative contribution of each category to the total variance:

$$m_i = \frac{n_i}{n}, \quad (2)$$

where n_i – frequency of the i-th category.

- Quality shows the proportion of point variance explained by the selected principal components:

$$Qali = \cos^2(i_1)\cos^2(i_2). \quad (3)$$

- Inertia reflects the total variance of the system and the measure of deviation from independence:

$$I = \frac{\chi^2}{n}. \quad (4)$$

- Cos² determines the square of the cosine of the angle between the original point and its projection on the principal component, characterizing the quality of point representation on the axis:

$$\cos^2(i_k) = \frac{f_{i_k}^2}{d_i^2}, \quad (5)$$

where f_{i_k} – coordinate of the point on the k-th axis d_i distance from the origin to the point.

Empirical studies were conducted using the Statistica software and RapidMiner artificial intelligence-based data analytics software [19], [20].

3 RESULTS AND DISCUSSION

Figure 1 presents the spatial distribution of AMLI values. The highest money laundering risks are demonstrated by countries of the African continent and some regions of Asia, particularly Congo, Haiti, Myanmar, Mozambique, and Madagascar. Moderate risks are observed in South American countries and part of European states. The lowest risk indicators are found in developed countries of North America and Western Europe, including Finland, Andorra, and Sweden. Australia also belongs to this group. This indicates varying quality of national legal regimes for combating money laundering.

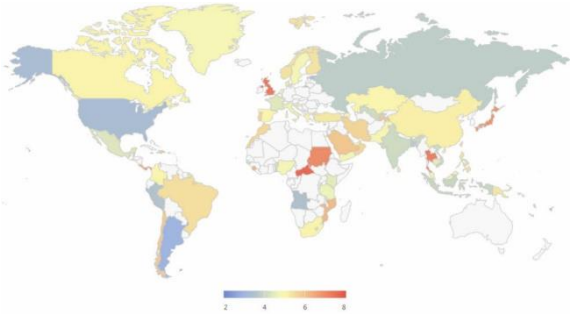

Figure 1: Spatial distribution of Basel AML Index scores.

Figure 2 illustrates the geographical distribution of FSI, where the highest levels of financial secrecy are characteristic of certain offshore jurisdictions, some developed countries such as the USA, Switzerland, the United Kingdom, Japan, Germany,

and Italy, as well as several other international financial centers.

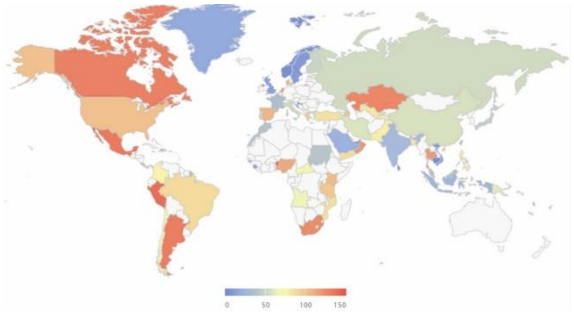

Figure 2: Spatial distribution of Financial Secrecy Index.

This result indicates the complexity of the relationship between different aspects of financial transparency and money laundering risks. This justifies the necessity of applying correspondence analysis, which will enable the identification of non-obvious interesting patterns for understanding the true relationships between these phenomena.

For conducting correspondence analysis, the numerical values of AMLI and FSI were recoded into categorical groups based on the uniform distribution of these indicator values among the analyzed 109 jurisdictions. This categorization allowed for revealing structural relationships between different levels of the studied phenomena.

Table 1 presents the descriptive statistics of the analyzed indices, according to which the recoding was performed.

Table 1: Descriptive Statistics of AMLI and FSI.

Index	Minimum	Maximum	Range
AMLI	2.96	7.59	4.63
FSI	1	138	137

Table 2 describes the algorithm for grouping countries by values of both indices. Each indicator was divided into five categories from “very low” to “very high” values, with clearly defined boundaries for each group.

Table 3 displays the distribution of 109 analyzed jurisdictions across cross-categories of AMLI and FSI.

The largest number of countries is concentrated in the “low AML” category (40 jurisdictions). The fewest countries fell into the “very high AML” category (9 jurisdictions), which indicates an uneven distribution of money laundering risks among the studied countries. This contingency table serves as the basis for conducting correspondence analysis.

Table 2: Grouping of countries by AMLI and FSI values.

Index	Rank	Range
AMLI	very low AML	< 3.9
	low AML	between 3.9 and 4.8
	medium AML	between 4.8 and 5.7
	high AML	between 5.7 and 6.6
	very high AML	>= 6.6
FSI	very low FSI	< 28.5
	low FSI	between 28.5 and 56
	medium FSI	between 56 and 83.5
	high FSI	between 83.5 and 113
	very high FSI	>= 113

Table 3: Summary frequency table for AMLI and FSI.

	AMLI Rank					Total
FSI Rank	very low	low	medi-um	high	very high	
very low	1	11	5	3	1	21
low	2	7	9	3	5	26
medium	3	6	12	2	1	24
high	4	8	6	1	1	20
very high	4	8	4	1	1	18
All gr.	14	40	36	10	9	109

Table 4 presents the results of decomposing the total system inertia into separate dimensions. Its value is 0.15, with Chi-square equal to 29.73 at 16 degrees of freedom and significance level $p = 0.04$. This indicates a statistically significant relationship between the studied indices.

Table 4: Eigenvalues and Inertia for 3 Dimensions for AMLI and FSI.

Dim.	Total Inertia = 0.15, $Chi^2 = 29.73$, df = 16, $p = 0.04$				
	Singular Values	Eigen-Values	Perc. of Inertia	Cumulat. Percent	Chi^2
1	0.28	0.07	47.81	47.81	8.00
2	0.22	0.05	32.84	80.64	5.50
3	0.17	0.02	19.27	99.91	3.22

Three main dimensions of interaction between variables were identified. The first dimension has the highest eigenvalue (0.07) and explains 47.8% of the total system inertia, indicating its dominant role in the structure of relationships. The second dimension with an eigenvalue of 0.05 additionally explains 32.84% of inertia. The third dimension with the smallest eigenvalue of 0.02 contributes 19.27% to the overall explanation. The three dimensions cover 99.9% of inertia, which indicates high quality of the 3-dimensional representation of relationships between money laundering risk categories and financial secrecy levels.

Table 5 presents the results of correspondence analysis for AMLI categories.

Table 5: Column/Row Coordinates (AMLI) and Contributions to Inertia.

Column Name	Mass	Quality	Relat. Inert.	Cos^2 Dim.1	Cos^2 Dim.2	Cos^2 Dim.3
very low	0.13	1.00	0.22	0.39	0.34	0.27
low	0.37	1.00	0.20	0.58	0.41	0.01
medium	0.33	1.00	0.20	0.30	0.52	0.18
high	0.09	1.00	0.08	0.23	0.54	0.22
very high	0.08	1.00	0.30	0.66	0.08	0.27

The largest share (Mass) is represented by countries with "low AML" (0.37), while jurisdictions with "very high AML" are the least represented (0.08). The Quality indicator equals 1.00 for all categories, which indicates high quality of their representation in the three-dimensional correspondence analysis space. Relative Inertia reflects the contribution of each category to the total inertia: the greatest impact is made by the "very high AML" (0.30) and "very low AML" (0.22) categories, indicating their largest deviation from the expected distribution under the assumption of variable independence. The "very high AML" category is best represented by the first dimension (Cos^2 = 0.66), while "high AML" is best represented by the second dimension (Cos^2 = 0.54). This indicates that different levels of money laundering risks have different patterns of interaction with financial secrecy categories.

Table 6 presents the results of correspondence analysis for FSI categories.

Table 6: Row Coordinates (FSI) and Contributions to Inertia.

Row Name	Mass	Quality	Relat. Inert	Cos^2 Dim.1	Cos^2 Dim.2	Cos^2 Dim.3
very low	0.20	1.00	0.23	0.94	0.68	0.23
low	0.24	1.00	0.31	0.85	0.05	0.10
medium	0.22	1.00	0.21	0.08	0.65	0.27
high	0.18	1.00	0.09	0.69	0.18	0.12
very high	0.16	1.00	0.15	0.74	0.01	0.26

By the Mass indicator, the most represented categories are "low FSI" (0.24) and "medium FSI" (0.22). The smallest share is represented by jurisdictions with "very high FSI" (0.16). This indicates a relatively uniform distribution of countries by financial secrecy levels. Quality equals 1.00 for all categories, confirming the high quality of 3-dimensional representation. By the Relative Inertia indicator, the greatest contribution to the total system inertia is made by the "low FSI" (0.31) and "very low FSI" (0.23) categories. This indicates their largest deviation from the expected distribution under the independence hypothesis. Different patterns of financial secrecy category representation were identified. The "very low FSI" category is best described by the first dimension (Cos^2 = 0.94), indicating its clear positioning in the interaction space. The "low FSI" category is also well represented by the first dimension (Cos^2 = 0.85). The "very high FSI" category is distributed between the first (Cos^2 = 0.74) and third (Cos^2 = 0.26) dimensions, indicating a more complex nature of relationships between high levels of financial secrecy and money laundering risk categories.

To improve the interpretation of correspondence analysis results, a three-dimensional visualization of the spatial positioning of AMLI categories (Row Coords.) and FSI categories (Column Coords.) in the coordinates of three main dimensions was constructed (Fig. 3). The diagram clearly shows polarization of categories along the main coordinate axes. The "very high AML" and "very low FSI" categories are located in opposite quadrants of the space, indicating a strong inverse relationship between these extreme categories. Thus, jurisdictions with the highest money laundering risks tend toward the lowest levels of financial secrecy.

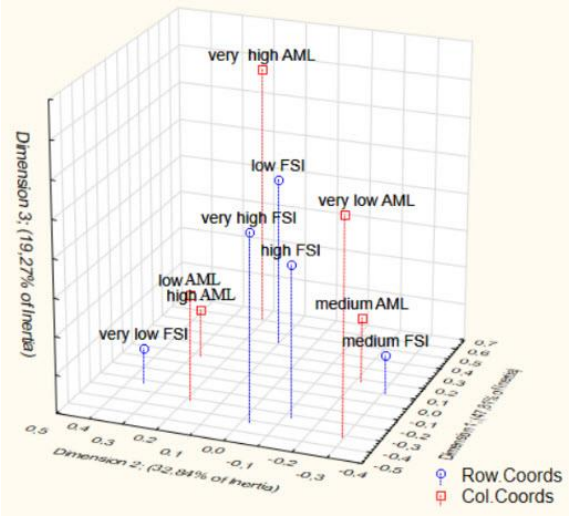

Figure 3: 3D plot of row and column coordinates.

The close positioning of the "medium AML" and "medium FSI" categories in the central zone of the diagram indicates their mutual association. Jurisdictions with moderate levels of financial secrecy have similar moderate levels of money laundering risks. The separate positioning of the "very low FSI" category from all other categories shows its uniqueness in the correspondence space. Jurisdictions with the highest financial transparency occupy a separate position, not associated with any of

the AML categories. The placement of the "low AML" and "very low AML" categories in different sectors of the diagram demonstrates their distinct profiles of relationships with FSI categories. The position of "high FSI" is closer to central categories than to extreme values, which may indicate its intermediate role in the system of relationships between financial secrecy and money laundering risks.

The obtained correspondence analysis results confirm the complex multidimensional nature of relationships between money laundering risks and financial secrecy levels, which cannot be adequately described by simple linear correlations. The statistically significant relationship between the studied indices ($p = 0.04$) and the identified structural associations between their categories indicates the necessity of a comprehensive approach to legal regulation of financial transparency. The absence of a clear correlation between extreme categories of AMLI and FSI suggests the existence of diverse regulatory models, where highly effective anti-money laundering systems can function under different levels of financial secrecy.

The identified associative relationships between medium categories of indices confirm the hypothesis of the existence of a "golden mean" in financial regulation, where balance between transparency and secrecy promotes stability of national financial systems. At the same time, the detection of unique positions of individual categories in the correspondence space demonstrates the diversity of national approaches to ensuring financial security. The obtained estimates indicate the limitations of universal recommendations in the field of anti-money laundering regulation and the necessity of developing differentiated policies that consider specific economic, legal, and institutional characteristics of each jurisdiction when forming effective mechanisms for combating money laundering. The obtained results justify the feasibility of developing composite indicators that combine AMLI and FSI for more accurate risk assessment and the formation of adaptive mechanisms for monitoring financial transactions.

4 CONCLUSIONS

The article examines the relationships between money laundering risks and financial secrecy levels among 109 world jurisdictions. Statistically significant relationships between AMLI and FSI ($\chi^2 = 29.73$, $p = 0.04$) were established. Correspondence analysis revealed three main dimensions of interaction that explain 99.9% of the total system inertia. Key findings reveal that the "low FSI" category makes the greatest contribution to system variability with relative inertia of 0.31 and mass of 0.24, while among AML categories, "very high AML" demonstrates the highest deviation from expected distribution (relative inertia 0.30, mass 0.08). The analysis identified an inverse relationship between "very high AML" and "very low FSI" categories, which occupy opposite positions in the correspondence space, indicating that jurisdictions with the highest money laundering risks tend toward the lowest financial secrecy. Conversely, an associative relationship was found between "medium AML" and "medium FSI" categories positioned in the central zone, suggesting balanced regulatory approaches. Notably, the "very low FSI" category demonstrates unique positioning (Cos^2 Dimension 1 = 0.94), remaining independent from any specific AML risk categories, which indicates that the highest financial transparency operates through mechanisms distinct from traditional anti-money laundering performance.

The scientific novelty consists in: (1) application of multidimensional correspondence analysis to simultaneously examine AMLI and FSI, revealing a three-dimensional structure of relationships; (2) identification of a paradoxical inverse relationship between the highest money laundering risks and lowest financial secrecy levels; (3) empirical demonstration that jurisdictions with maximum transparency form a distinct cluster independent of AML performance categories.

The identified complex nonlinear structure of relationships between AMLI and FSI indicates the necessity of moving away from universal regulatory solutions in favor of differentiated approaches that consider specific characteristics of national legal systems. The existence of balanced jurisdictions with moderate levels of both indicators, as well as the absence of direct associations between extreme categories, points to the possibility of creating effective anti-money laundering mechanisms under different financial confidentiality regimes. This justifies the feasibility of developing a multi-level system of international legal regulation that will allow combining global standards for combating financial crimes with respect for national peculiarities of legal regulation of banking secrecy and corporate transparency.

The obtained results can be used for developing differentiated approaches to international legal regulation of financial transparency, particularly, creating mechanisms for mutual recognition of standards and developing composite indicators for more accurate risk assessment, improving the system for evaluating the effectiveness of national anti-money laundering regimes, and forming targeted

recommendations for different jurisdictions depending on their characteristics.

Promising directions for further research include analyzing the impact of specific legal institutions on the formation of identified interaction patterns, as well as expanding the analysis by including additional indicators of regulatory environment and economic development to build a comprehensive model of financial transparency determinants at the global level.

While this cross-sectional analysis provides insights into structural relationships at a specific point in time, we acknowledge its temporal limitations. Future research will extend the analysis to a multi-year period to examine the stability of identified patterns and reveal potential causal mechanisms and temporal dynamics in the AMLI-FSI relationships.

REFERENCES

[1] Zigram, "Money Laundering Statistics 2024," Jan. 29, 2025. [Online]. Available: https://www.zigram.tech/resources/money-laundering-statistics-2024/.

[2] W. Gaviyau and A. B. Sibindi, "Global Anti-Money Laundering and Combating Terrorism Financing Regulatory Framework: A Critique," Journal of Risk and Financial Management, vol. 16, no. 7, Art. no. 313, 2023, doi: 10.3390/jrfm16070313.

[3] A. AlQudah, M. Hailat, and D. Setabouha, "Money Laundering in Global Economies: How Economic Openness and Governance Affect Money Laundering in the EU, G20, BRICS, and CIVETS," Journal of Risk and Financial Management, vol. 18, no. 6, Art. no. 319, 2025, doi: 10.3390/jrfm18060319.

[4] A. Korauš, E. Jančíková, M. Gombár, L. Kurilovská, and F. Černák, "Ensuring Financial System Sustainability: Combating Hybrid Threats through Anti-Money Laundering and Counter-Terrorist Financing Measures," Journal of Risk and Financial Management, vol. 17, no. 2, Art. no. 55, 2024, doi: 10.3390/jrfm17020055.

[5] FATF, "FATF, Egmont Group, INTERPOL and UNODC call for stronger co-operation between countries as they launch handbook to fight money laundering," 2025. [Online]. Available: https://www.fatf-gafi.org/en/publications/Methodsandtrends/international-cooperation-against-money-laundering.html.

[6] O. Kovalchuk, R. Shevchuk, and S. Banakh, "Cryptocurrency Crime Risks Modeling: Environment, E-Commerce, and Cybersecurity Issue," IEEE Access, vol. 12, pp. 50673–50688, 2024, doi: 10.1109/ACCESS.2024.3386428.

[7] Chainalysis, "2025 Crypto Crime Trends: Illicit Volumes Portend Record Year as On-Chain Crime Becomes Increasingly Diverse and Professionalized," Jan. 15, 2025. [Online]. Available: https://www.chainalysis.com/blog/2025-crypto-crime-report-introduction/.

[8] Tax Justice Network, "Financial Secrecy Index," Jun. 2025. [Online]. Available: https://fsi.taxjustice.net/full-list/#scoring_id=268.

[9] J. A. Sousa Torres et al., "Ontology Development for Asset Concealment Investigation: A Methodological Approach and Case Study in Asset Recovery," Applied Sciences, vol. 14, Art. no. 9654, 2024, doi: 10.3390/app14219654.

[10] S. Sholli, "$492bn Lost in Tax Revenues to Havens Each Year: Report," Nov. 19, 2024. [Online]. Available: https://www.internationaltaxreview.com/article/2e1m41z3ozv57iu0hnsao/direct-tax/492bn-lost-in-tax-revenues-to-havens-each-year-report.

[11] FATF, "Targeted Update on Implementation of the FATF Standards on Virtual Assets/VASPs," 2024. [Online]. Available: https://www.fatf-gafi.org.

[12] FATF, "Complex Proliferation Financing and Sanctions Evasion Schemes," 2025. [Online]. Available: https://www.fatf-gafi.org/content/fatf-gafi/en/publications/complex-proliferation-financing-sanctions.

[13] FATF, "Financial Action Task Force Identifies Jurisdictions with Anti-Money Laundering, Countering the Financing of Terrorism, and Counter-Proliferation Finance Deficiencies," Jun. 23, 2025. [Online]. Available: https://www.fincen.gov/news/news-releases/financial-action-task-force-identifies-jurisdictions-anti-money-laundering-3.

[14] FATF, "Outcomes FATF Plenary," Jun. 26–28, 2024. [Online]. Available: https://www.fatf-gafi.org/en/publications/Fatfgeneral/outcomes-fatf-plenary-june-2024.html.

[15] R. Barone, "D. Masciandaro. Green Grease: Environmental Crime, Corruption and Money Laundering," Kyklos, vol. 78, pp. 991–1006, 2025, doi: 10.1111/kykl.12455.

[16] Basel Institute on Governance, "Basel AML Index 2024: 13th Public Edition Ranking money laundering risks around the world," 2024. [Online]. Available: https://index.baselgovernance.org/.

[17] K. Berezka and O. Kovalchuk, "Associative Rules for Modeling International Security Decisions in the Context of the Ukrainian-Russian War. Preliminary Evaluations," Folia Oeconomica Stetinensia, vol. 23, no. 2, pp. 67–85, 2023.

[18] STHDA, "Principal Component Methods in R: Practical Guide," 2025. [Online]. Available: https://www.sthda.com/english/articles/31-principal-component-methods-in-r-practical-guide/113-ca-correspondence-analysis-in-r-essentials/.

[19] StatSoft, Inc., "STATISTICA (Data Analysis Software System), Version 10," 2011. [Online]. Available: http://www.statsoft.com.

[20] Altair, "RapidMiner," 2025. [Online]. Available: https://altair.com/altair-rapidminer.