A BIBLIOMETRIC ANALYSIS OF MONEY LAUNDERING AND ANTI MONEY LAUNDERING: MAPPING, CURRENT STREAM AND FUTURE RESEARCH AGENDA

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Abstract

A serious worldwide issue that poses a risk to economies is money laundering. International money laundering and its threat to a country's financial system and economy are the main issues that governments are currently dealing with. Given the importance of topic, this study provide an analysis of the extent of literature and intends to highlight critical authors, journals, and papers and reflect the shift of research focus on Money Laundering and Anti Money Laundering from 1999 to 2023 using bibliometrics analysis to examine the bibliographic metadata connected to 312 displayed, Scopus-indexed publications. The visualization of similarities (VOS viewer) software was used to perform a co-occurrence analysis of all publication trends, leading authors, and keywords. The result of the analysis show a steady increase in studies on the topic since 2017, and shows that more collaboration between authors across countries and territories needed. Therefore, comparative studies on this subject must reveal undiscovered insights from other cultures and societies. Additionally, the results showed that scholars frequently focus their research on the following sub-topics when studying money laundering and anti-money laundering: financial action task force (FATF), AML compliance, AML Laws & Regulations effectiveness and performance, Risk-Based AML, Crypto Currency and ML, AML policy and regime effectiveness, customer due diligence, beneficial ownership& PEPs, and terrorist financing. In recent years, academics have focused more on beneficial ownership, PEPS, compliance with AML/CFT standards, laws, regulations, and the Risk-Based Approach. The findings are significant and act as an introduction for academics unfamiliar with this subject also a thematic guide to those interested in the topic for further research.

Keywords: *Bibliometrics Review, Money Laundering, Anti Money Laundering*

INTRODUCTION

Money laundering has been presented as a national and international concern over the past decades and is considered a menace to targeted organizations and overall economies. Money laundering is the process of concealing and disguising the true origin of money, and it is used as a tool and mechanism for disguising the source of income, mainly obtained through illegal activities such as drug trafficking, human trafficking, embezzlement, kidnapping, etc. Money laundering mostly happens and follows three stages: Placement, Layering, and Integration. At the initial stage of money laundering, illegal funds are introduced into the financial system. In order to successfully disguise the origin of money, the launderer uses different methods to complicate the tracking of money, called the layering stage. In the last stage, the ill-gotten money injects into the economy through investment and other mechanisms as legally obtained money, called the integration stage. The ill-gotten money can be laundered by going through mentioned three stages.

The most prominent targets of launderers for money laundering are financial institutions and banks. Therefore to safeguard financial institutions and banks and disrupt money laundering, specific measures and mechanisms in the form of policy, procedures, processes, and programs are the regulatory requirements for financial institutions and banks, and the same has been recommended by the intergovernmental body Financial Action Task Force (FATF) through its recommendations, interpretive notes; and other similar organization in national and international level. These measures are mainly referring to Anti Money Laundering.

In recent years, there has been a slight increase in the literature examining compliance with Anti-money Laundering standards/ policies & processes Risk-Based AML, AML effectiveness, and performance. For instance,(Emmanuel Senanu, 2002)investigated how sound countries comply with global Anti-Money Laundering and Counter-financing of Terrorism (AML/CFT) regulations and found that AML/CFT compliance

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levels have improved slightly over the past decade. However, compliance levels remain low and leave so much room for improvement; the study findings also suggest that richer countries record relatively higher compliance levels than poor countries, so countries need to work harder towards improving their compliance with DNFBPs recommendations since DNFBPs present new methods and opportunities to money launderers.(Lokanan & Nasimi, 2020) Assessed the effectiveness of AML policies and procedures in Bahrain's banks and found that despite Bahrain's compliance with international AML procedures, the regulatory technology still needs to be addressed. Specifically,(Maximilian et al., 2019)aimed to demonstrate the ongoing feasibility of money laundering and financing terrorism undetected and highlighted that the current anti-money-laundering and anti-terrorismfinancing mechanisms could easily be circumvented and emphasized that compliance officers are often largely unaware of the methods used by money launderers and terrorism financiers.

Accordingly, an up-to-date systematic analysis of academic literature on Money Laundering and Anti Money Laundering is indispensable for further research frames, policy agendas, and disrupting money laundering plans and programs.

Therefore, this study focused on capturing the movement of research focus andhighlighting top authors, journals, and documents on Money Laundering and Anti Money Laundering from 1999 to 2023 in the Scopus database, using science mapping techniques. Science mapping analyzes bibliographic information associated with studies to reveal a knowledge base's evolving social, intellectual, and conceptual structures (Zupic & Čater, 2015). This review tackled the following research questions:

RQ1. What are the volume, growth trajectory, geographic distribution, and popularresearch sources on Money Laundering and anti-money laundering?

RQ2. What authors, journals, and documents have evidenced the most remarkable impact among research on Money Laundering and Anti Money Laundering?

RQ3. What do scholars focus on this topic across different periods?

LITERATURE REVIEW

Following review of the existing literature on the topic and exploring the term money laundering and anti money laundering, and recent studies and research on the topic, some of them are referred here. Firstly, literature to describe the term money laundering and its process referred. Secondly, International measures to prevent Money laundering referred. Finally, some of relevant studies and articles from different aspects are referred.

Theoretical context:

Dishonesty is the cornerstone of money laundering. Its goal is to deceive the authorities about the sources, existence, and usage of illegal income and the subsequent processing of that money to give the impression that it was obtained legally. Money laundering serves the interests of many criminal groups, including terrorists, organized crime, insider dealers, tax evaders, and drug traffickers, who want to avoid the kind of attention that sudden income from illicit operations brings from the police. The money generated by these enterprises is being placed at a "facility" where asset seizure laws do not apply. The practice of hiding the source of proceeds from illegal activities and integrating them into the established financial community is known as money laundering. (Sullivan, n.d.) The act of making illicit monies seem legitimate is known as money laundering, but the funds themselves are never truly legitimate. Three steps make up the money laundering cycle: placement, layering, and integration. (MADINGER, 2012) In order to conceal the true source of financial assets and allow for the use of the proceeds without exposing the perpetrators, money laundering typically entails a series of multiple transactions. The goals of drug dealers, terrorists, organized crime, insider dealers, and many more people who seek to avoid the kind of attention from the authorities that sudden gain from illicit activities brings are fundamentally facilitated by money laundering. (Sullivan, n.d.) Drug traffickers and other criminal groups have created a number of extremely sophisticated strategies and tactics intended to launder the money and to keep it out of the hands of the law enforcement; There are several entry sites into the global financial system are the favorable conditions, Funds are transferred quickly, which makes investigators' jobs more challenging, Inadequate oversight of the transfer of substantial amounts of money through banks and other financial operations, The lure of corruption and bribery in the shadowy realm of finance, The existence of unofficial, parallel economies that are unregulated by the state. (BHURE, 2003) The threats of international money laundering and terrorist financing are still increasing; there is a need for coordinated international action against these persistent threats, which have an impact on everything from large outflows of trillions of dollars due to organized crime and corruption to well-funded terrorist actions. (Basel, 2023)

International efforts to prevent Money Laundering:

Promoting Anti Money Laundering (AML) Recommendations to worldwide governmental groups is spearheaded by Financial Action Task Force (FATF). One of the most critical aspects of the FATF's work is its extensive list of pertinent standards that countries might adopt. The FATF has also published several interpretive notes to provide more details and clarify how specific recommendations should be implemented. The concept for effective national and international AML and CFT related controls has developed

from the recommendations of the FATF. The IMF and World Bank have recognized the FATF Recommendations as the international standards for combating money laundering and the financing of terrorism. A comprehensive set of countermeasures against money laundering and terrorism funding is provided by the FATF 40 Recommendations, which address the following: identifying AML risk and developing suitable policies, the financial system and its regulation, the criminal justice system and law enforcement, the openness of legal entities and agreements, and international collaboration.

Recent Articles on the topic:

Gerbrands, P., Unger, B., Getzner, M., &Ferwerda, J. (2022). The study using an empirical network analysis, attempted to investigate the effect of anti-money laundering policies on the behavior of money launderers and their networks in the Netherlands. The study hypothesized that the strengthening of AML policies in the form of new European Union Directives create hardship for launderers in laundering money and might urge them to specialize more in terms of money laundering methods and targeting region, and will create dynamics of criminal networks caused by specialization, the collaboration of professionals and competition among criminal networks to use money laundering professionals. The study attempted to test the effect of it both at the group and individual levels; the result stated that the effect of increased levels of specialization and, consequently, competition and collaboration are observed both on individual and group levels. The study indicated that Anti-Money Laundering policies complicate the money laundering environment and force the launderers towards specialization and collaboration. It also indicated a significant increase in the use of foreigners and corporate structures after announcing the fourth European Union Directive on Anti-Money Laundering. The study concluded that money laundering clusters grow more substantially in size and diameter compared to other criminal networks, increasing the exposure of money launderers and their chance of getting caught.

Bahrain, N. L., Yusuf, S. N. S., Muhammad, K., &Ghani, E. K. (2022) mainly focused on examining the influencing factors on the effectiveness of Anti-Money Laundering (AML) programs among bank employees, specifically the three factors IT infrastructure, staff experience, and rules and regulations. For this purpose, a questionnaire method was applied, and one hundred and fifty-two AML analysts were targeted for the study's survey. The result showed that two factors, namely staff experience and rules and regulations, significantly influence an AML program's effectiveness. The IT infrastructure factor significantly negatively influences an AML program since banks may need help to adapt to the rapid changes in the system software used in AML programs. The findings of the study indicated that banks might need to take strategic and proactive policies or measures such as regularly reviewing and updating existing policies and procedures to increase their staff's knowledge and understanding of their AML/CFT policies and procedures as well as reviewing their strategies in adapting of newer technology related to AML program. The study suggested adopting compliance software with Artificial Intelligence features that fit the banks' operation and can help mitigate the risk of errors in keeping track and monitoring activities.

Naheem, M.A. (2021). The study aimed to examine the level of anti-money laundering (AML) and combating terrorist financing (CTF) practices incorporated within the legal framework of the Kingdom of Bahrain. The paper also studied the application of AML/CFT legislation in regulatory practice and implementation. The study findings showed significant progress in applying best practices of AML/CFT within the Kingdom of Bahrain. The paper also found an increase in levels of implementation- i.e., suspicious transaction reports, investigations, and prosecutions for AML/CFT violations. Additionally, the paper found that there needed to be more deficiencies in Bahrain's effort to establish robust reporting and enforcement mechanisms.

Tiwari, M., Gepp A. and Kumar, K. (2020). The purpose of the study was to review the literature on money laundering and its related areas. The study's main objective was to identify gaps in the literature and direct attention toward addressing them. The findings of the study stated that the literature on money laundering could be classified into the following six broad areas: anti-money laundering framework and its effectiveness, the effect of money laundering on other fields and the economy, the role of actors and their relative importance, the magnitude of money laundering new opportunities available for money laundering and detection of money laundering. Most studies about the detection of money laundering have focused on using innovative technologies, banking transactions, or real estate and trade-based money laundering. However, the literature on detecting shell companies explicitly used to launder funds is relatively scarce. Overall, the study set the tone for further research work to be carried out in the area of money laundering, which is currently doing substantial damage to economies all over the globe.

Yeoh, P. (2020). The study aimed to explain why money laundering persists in banks and their weaknesses as gatekeepers. The paper's findings suggested that competitive pressures, shareholders' return imperative, and lucrative misaligned incentives for management contributed to weaknesses in effective compliance in banks. Insights drawn from the study reinforce the notion that banks need to review their business approaches and roles as gatekeepers seriously. The study's concluding remarks stated that as banking transforms digitally and cryptocurrencies strive to enter the financial mainstream, banks and regulators must work together as collaborative gatekeepers to deter money laundering in the financial system.

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METHODS

3.1 Identification of data

Bibliographic data from published articles can be analyzed using science mapping techniques toportray the overall knowledge base within a research topic (Small, 1999). Popular databases for bibliometrics analyses are Clarivate, Web of Science, Scopus, Pub Med, and Dimensions.(Alryalat et al., 2019) It was stated that Scopus covers publications from 1970. Due to its widespread usage, adequate coverage, and high standards, this research chose the Scopus database as the primary data source for this study.

This research adopted the preferred reporting items for systematic reviews and Meta-analyses (PRISMA) flow (Moher et al., 2011)as the guideline for collecting data (Figure 1). On 13th May 2023, by entering search keywords of Money Laundering, Anti-Money Laundering, and Anti-Money Laundering on the targeted database, a total of 1256 published articles in all formats were identified. Afterward, the author applied several inclusion and exclusion criteria to refine the concise of the data set (Table 1). During the identification process eliminated 580 unrelated field articles and came up with 676 for screening. Finally, 364 articles were excluded in the screening process, limited to the Articles, English Language, and Exact Keywords, and a final 312 articles were ready for further analysis.

Database Search Query: (TITLE-ABS-KEY("Money Laundering" And "Anti Money Laundering" OR "Anti-Money Laundering") AND (LIMIT-TO (SUBJAREA, "ECON") OR LIMIT-TO (SUBJAREA, "BUSI")) AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT-TO (EXACT KEYWORD, "Money Laundering") OR LIMIT-TO (EXACT KEYWORD, "Anti-money Laundering")))

Table 1. Inclusion and exclusion criteria used to refine the data set

Inclusion Criteria	Exclusion Criteria
• Field categories: Economics, Econometrics, Finance, Business, Management, and Accounting.	• Unrelated Field
• Journal Articles	• Books, conference proceedings, chapters, etc.…
• Articles published in the English language.	• Articles other than the English language.

Keywords: Money Laundering, Anti-Money Laundering, and Anti-Money Laundering.
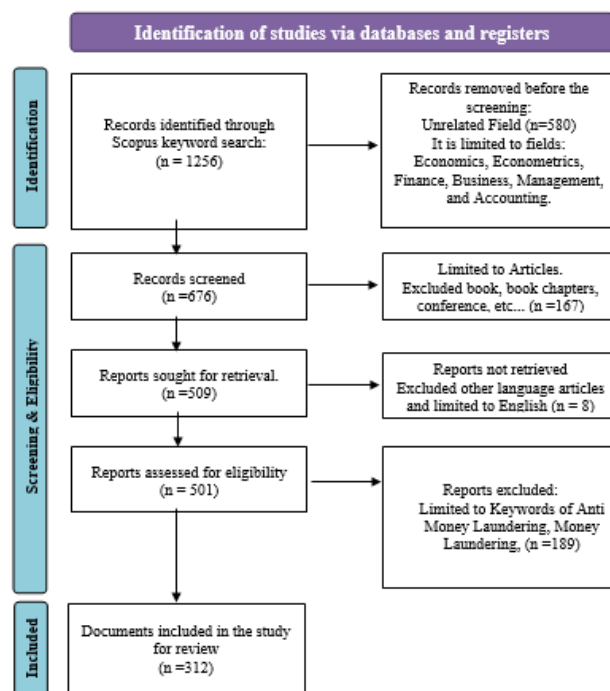
Figure 1. Preferred reporting items for systematic reviews and Meta-analyses (PRISMA) flow diagram detailing the procedure to identify and screen homework databases.

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3.2 Data Extraction and Analysis

3.2.1 Disambiguate similar names and terms. The researcher downloaded the data set of 312articles from the Scopus website in Excel. This data set included metadata: Authors, Author's full names, Author's ID, Title, Year, Source Title, Abstract, Language, citation, and other information.

Hallinger and Chatpinyakoop (2019) are concerned that similar terms and names mightmisconduct bibliometricanalysis results. Therefore, within this data set, the researcher comparedThree hundred and twelve data lines and found no difference in typing the same author's name. However, terms have been written differently. To ensure the consistency of this data set, wefounded and adjusted "Anti-Money Laundering" into "Anti Money Laundering" (1581 times). The adjustments will help increase the significance of this study's findings.

3.2.2 Methods and Tools. This study adopted various science mapping techniques to understand the research's conceptual and social structures on Money Laundering and anti-money laundering. Descriptive and bibliographic analyses were conducted using Excel, R program (Biblioshiny package), and VOS viewer version 1.6.17. Using Excel, the researchers plotted several bar charts and descriptive tables to tackle the first research question about publication volume and growth trajectory. The researcher used Biblioshiny, an available package for R programming (Aria &Cuccurullo, 2017), to conduct several co- citations, collaboration, and thematic revolution analyses. In addition, the author performed co-occurrence analyses using a VOS viewer.

DESCRIPTIVE RESULTS

4.1 Volume, growth trajectory, and Distribution

Figure 2 presents similar growth trends of publications on Money Laundering and Anti Money Laundering. Before 2007, the research productivity on this topic was not worth mentioning. Only eight research papers were published in 8 years (from 1999 to 2007), meaning an average of 1 paper per year. Since 2007, research on this topic has been dramatically and continues growth. In particular, 304 studies have been published, which accounted for 97.5 % of research on this topic. The year 2020, 2022, and the second quarter of 2023 were also remarkable because they recorded the highest number of publications on this topic. More specifically, while the volume of publication in ten years (from 2007 to the end of 2015) was 68 articles (an average of 7.5 papers per year), there were 236 articles published from 2016 to 2023 (an average of 29.5 papers per year), not to mention that this data set did not index papers published after 13th May 2023 yet.

Regarding the distribution of publications across countries and territories, this research considers the corresponding author's country as the home country of the publication. Indeed, the limitation of this method is that it might omit the efforts of researchers from emerging countries who are not corresponding authors. To supplement this weakness, we also measured the single country publication (SCP) and multiple countries publications (MCP) to estimate the scope of omitted countries and authors. Figure 3 contains information about the SCP and MCP of the top 20 countries with the highest total publications (TP). The United Kingdom was dominant, with 32 articles, including 30 SCP and 2 MCP. The second, third, and fourth positions belong to Switzerland, Australia, and Malaysia, totaling 23, 18, and 17 papers, respectively. Even though Malaysia produced17 works, 5 of each wereMCP due to their collaborationswith other countries. This absolute number of MCP from Malaysia is more than that of the United Kingdom.

Moreover, Australia, Pakistan, and Netherlands' MCP are more than the United Kingdom, while other countries have equal or less than 2 MCP. For instance, among 23 papers from Switzerland, there were 0 MCP, meaning that Switzerland's authors have yet to collaborate with peers from their countries. Likewise, Germany, the USA, South Africa, Italy, Denmark, India, and Tanzania are with 0 MCP. Similarly, authors fromeither Canada, Nigeria, Ghana, New Zeeland, or the United Arab Emirates have 2 MCP, which is equal to that of the United Kingdom.Also, authors from Kenya conducted five works in total and have 1 MCP collaboration with authors from the country.

Therefore, the trend of international collaboration is only somewhat popular on this topic. Overall,while authors from the top five countries published 104/312 articles (33.34%), the other 15 countries in the top 20 contributed 92/312 articles (29.49%). All other countries worldwide accounted for only 37.17% of the corpus, with 116/312 articles.
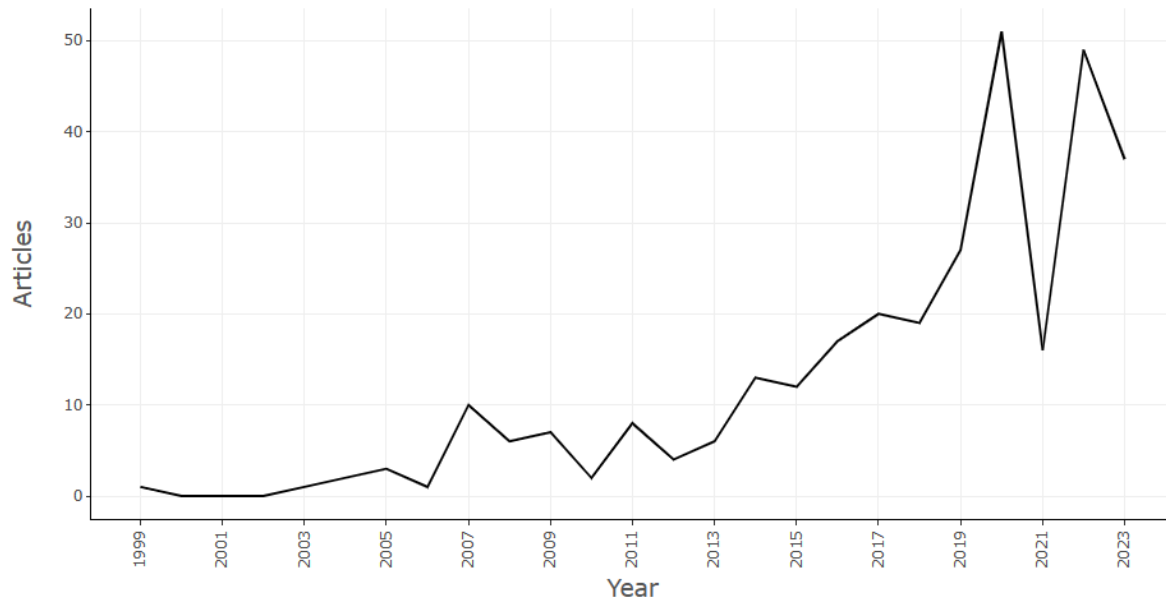
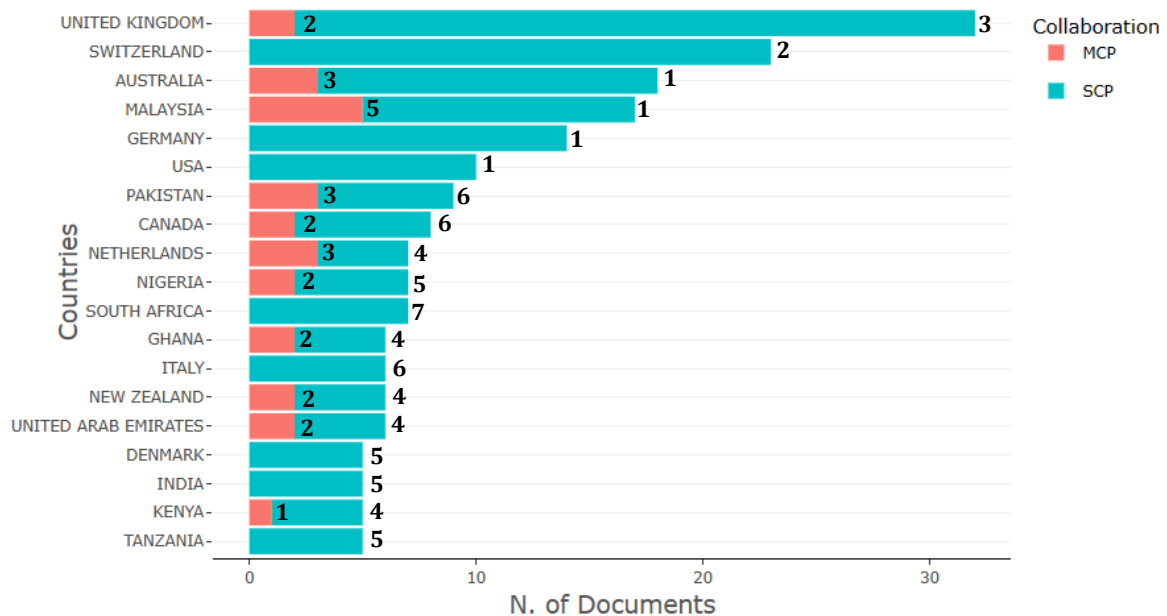Figure 2. Annual Scientific production (from 1999 to 13th May 2023)
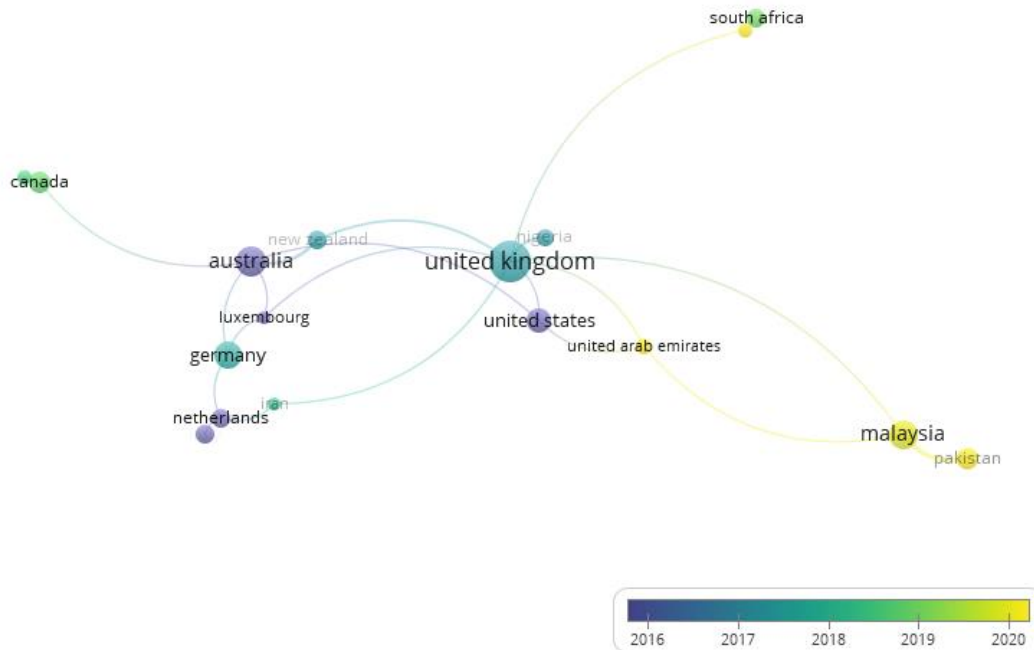

Figure 3. Publication by countries

4.2 MCP: multiple countries publication; SCP: single country publication

In addition to the overall quantity of MCP, as displayed in Figure 3, Figure 4 depicts the collaboration patterns between countries, considering countries with at least five publications.

The color scheme in this figure stated that the United Kingdom, Germany, New Finland,and Nigeria had established their connections very early (nodes in Aqua Blue), and the emerging collaborations are from Malaysia, Pakistan, South Africa, and United Arab Emirates (nodes in yellow).Besides the number of publications per country, we must evaluate each country's research quality. This study considered a country's research quality by two citation metrics: total citations (TC) and average article citations (AAC). This data set of 312 research articles consists of 60 countries. However, 11 countries still did not receive any citations for their works. The remaining 49 countries have obtained 1,772 citations within the Scopus database. Table 2 presents the TC and AAC of the top 20 countries, and Figure 5 represents the most cited countries.

Regarding the top four countries in the number of publications (Figure 3), only the United Kingdom and Switzerland can secure their leading position in TC. At the same time, Australia and Malaysia dropped out of the top four, and Germany and Netherlands took their position, respectively (Table 2). Research by authors from the United Kingdom and Switzerland gained 272 and 222 citations, a total of 494, making 28.78% of all citations achieved by this data set. Germany and Netherlands, with 164 citations (9.27%) and 162 citations (9.14%), respectively in the order, created huge gaps with the other runner-up. However, considering AAC

metrics, the United Kingdom has only 8.50 citations per article due to its vast number of publications (32). The highest AAC score belonged to Georgia, with an AAC of 61.00, over 1 article. The Netherlands has the second-highest AAC score of 23.10 over its six articles. The third and fourth positions belong to Ukraine and Italy, with AAC of 22 (over one article) and 20.20 (over six), respectively.

(Figure 4. Collaboration by countries)

Country	TC	Average Article Citations
UNITED KINGDOM	272	8.50
SWITZERLAND	222	9.70
GERMANY	164	11.70
NETHERLANDS	162	23.10
AUSTRALIA	149	8.30
ITALY	121	20.20
GEORGIA	61	61.00
BELGIUM	53	17.70
USA	52	5.20
NEW ZEALAND	49	8.20
CANADA	41	5.10
GHANA	35	5.80
HONG KONG	31	15.50
NIGERIA	31	4.40
MALAYSIA	29	1.70
UNITED ARAB EMIRATES	29	4.80
LUXEMBOURG	26	6.50
UKRAINE	22	22.00
SPAIN	21	5.20
IRAN	16	8.00

Table 2. Most Cited Countries

In addition to the above geographic distribution, this research also explored the impact of top sources of publications on this research topic. All 312 articles in this data set have been published in 64 journals. Table 3 presents the top 12 sources with the most works on this topic. Besides, there were two other journals with two

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publications, and the rest just published one paper about Money Laundering and Anti Money Laundering. Generally speaking, research on this topic was often published in the Journal of Money Laundering Control.

Top journals' impacts were identified using the h-index, number of publications, and number of citations. Table 3 includes 12 journals that have an h-index of 2 and above. There are 5 Journals with an h-index of 2, 3 with an h-index of 3, and the remaining four journals with a higher h-index of 4, 7, 8, and 16, respectively. Those low h-index scores prove that Money Laundering and anti-money laundering still need more investigation.
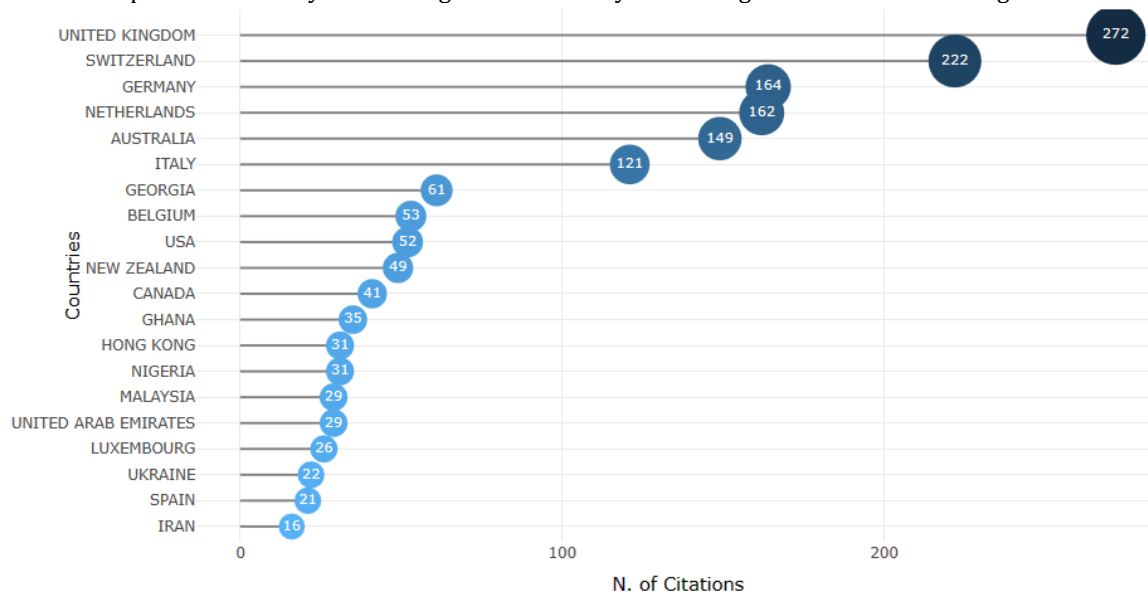

Figure 5. Most Cited Countries

Regarding the three high-index journals, it is evident that the Journal of money laundering control was the most dominant source, with an h-index of 16 (which is two times higher than the second Journal), 189 articles, and 954 citations (53.83% of total citation) While second and third Journal with an h index of 8 and 7 with the 23 and 16 publications, 175 and 122 citations (9.87% and 6.88%) respectively shows a considerable difference. Indeed, the Journal of Money Laundering Control deserves first place due to its early entrance and continuous contributions to this topic. Although the Journal of Financial Regulation and Compliance published the first paper on this topic in 2003, it published only 16 articles after two decades. Moreover, this Journal received TC of 122 (6.88%), and Naheem M.A. (2015) and Mugarura N. (2011) are the two papers that received the highest citation of 26 and 18, respectively, in this Journal.

4.3 Influential authors and documents

To determine the most influencing authors and documents within this dataset, the researcher analyzed multiple indicators such as TC, number of articles (in total), h-index, and the year of the author's first publication (Table 4). While the TC and the number of articles can help readers capture the first overview of the top authors' productivity, other indicators bring more insight into the author's impact. Regarding measuring the author's research quantity and quality, this table considered the h-index as the primary measurement. Besides, the researcher filtered authors who received at least 31 citations. Therefore, some authors with an h-index of 3 did not appear in this table. In addition, some authors received many citations but a lower h-index of 3. For instance, DE KOKER L and JENTZSCH N published one research study on this topic and received 74 each.

No.	Journals	h index	Total Citation	Number of Publications	Year of first publication on this Topic
1	JOURNAL OF MONEY LAUNDERING CONTROL	16	954	189	2004
2	JOURNAL OF FINANCIAL CRIME	8	175	23	2006
3	JOURNAL OF FINANCIAL REGULATION AND COMPLIANCE	7	122	16	2003
4	REVIEW OF LAW AND ECONOMICS	4	148	4	2009
5	GLOBAL BUSINESS AND ECONOMICS REVIEW	3	21	3	2008
6	INTERNATIONAL REVIEW OF LAW AND ECONOMICS	3	59	3	2010
7	RESEARCH IN INTERNATIONAL BUSINESS AND	3	114	3	2004

	FINANCE				
8	COGENT ECONOMICS AND FINANCE	2	4	3	2022
9	COMPUTER LAW AND SECURITY REVIEW	2	43	2	2017
10	JOURNAL OF BANKING REGULATION	2	31	5	2012
11	QUALITATIVE RESEARCH IN FINANCIAL MARKETS	2	17	3	2009
12	SECURITY JOURNAL	2	14	3	2017

Table 3. Most Impactful Journals

Table 4 shows that most authors in the top 11 highest citations publish three and more than three articles on Money Laundering and Anti Money Laundering. NAHEEM MAshared first place with 257 citations from 17 works, starting in 2015. All of his work focuses on Money laundering; Anti-money laundering; Combating terrorist financing (CTF); Financial intelligence units (FIUs); Illicit financial flows; Politically exposed persons; the Charity sector; the banking system; Customer due diligence; Digital currency; Risk-based assessment; Virtual currency; Agency theory; Banking regulation; Trade-based money laundering; Suspicious activity reports; Beneficial ownership; Investment laundering; financial crime; risk management; AML risk assessment; Audit internal and external; Real estate; Compliance; Corporate social responsibility; Trade-based money laundering. For instance, his work aboutMoney laundering using investment companies (Naheem M.A.2015) received 31 citations, the study about theHSBC Swiss bank accounts-AML compliance and money laundering implications (Naheem M.A.2015) got 26 citations, and another paper about Money laundering: A primer for banking staff (Naheem M.A.2015) got21citations.

In 2009, UNGER Bpublished five articles with an h-index of 5 and 119 citations. His works covered issues related to Anti-money laundering policy; Money laundering; Social networks; the Gravity model; International trade; Walker model.

GILMOUR N has five articles and got 36 citations. More citations were obtained from the paper "Preventing money laundering: A test of situational crime prevention theory" (Gilmour N., 2016) with 12 citations. POL RF shared fourth place with four articles in 2018, 2019, and 2020 with a total citation of 44; however, the total citation is more than GILMOUR N but produced one less article and started work later.

TEICHMANN FMJ can be considered a rising star on this research topic. He started in 2017 but has already published 14 articles mainly focused on methods of Money Laundering, its challenges, and risks, and got 57 citations. His first paper, "Twelve Methods of Money Laundering," published in 2017, got the highest citation of 20. FALKER M-C can also be considered a rising star on this research topic. He has published nine articles with a total citation of 31; interestingly, he published six papers in his starting work year of 2020 and got most of the citations on those papers. MASCIANDARO D got the second highest citation of 144 but published only five works over two decades. However, he got more citations, but considering his early starting work and a few publications, he got tenth in the table.

Regarding the remaining three authors in the table, DOLAR B, FERWERDA J, and SHUGHART WF, compared to all other authors, started work in earlier 2007 and 2009. However, the number of their work is less; all three were published only three papers. However, they got more citations, but considering their starting work year, the number of articles, and h Index, they are placed sixth, eighth, and eleventh, respectively.Most contributions to the literature on Money laundering and Anti Money Laundering have been published in the last decade.

No.	Author	h Index	TC	Articles	Started
1	NAHEEM MA	12	257	17	2015
2	UNGER B	5	119	5	2009
3	GILMOUR N	4	36	5	2015
4	POL RF	4	44	4	2018
5	TEICHMANN FMJ	4	57	14	2017
6	DOLAR B	3	38	3	2007
7	FALKER M-C	3	31	9	2020
8	FERWERDA J	3	92	3	2009
10	MASCIANDARO D	3	144	5	1999
11	SHUGHART WF	3	38	3	2007

Table 4.Most Influencing Authors

Table 5 presents the 16 articles that received the highest citations from the Scopus database (Global citations) and Average Citation per year.

Ranked first place, the work of MASCIANDARO D(1999) received the highest number of global citations (97) as well as (3.88) average citations per year. Within this list of top 16 articles, DE KOKER L (2013) and BUCHANAN

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B (2004) got the global citation of 74 (Avg. 6.73) and 61 (3.05) and placed second and third, respectively. NAHEEM MA (2015) is the paper that received fewer global citations (31) and placed last in the table.

No.	Paper	Year	Journal	DOI	Global Citations	Average Per Year
1	MASCIANDARO D	1999	EUROPEAN JOURNAL OF LAW & ECONOMICS	10.1023/A:1008776629651	97	3.88
2	DE KOKER L	2013	WORLD DEVELOPMENT	10.1016/j.worlddev.2012.11.002	74	6.73
3	BUCHANAN B	2004	RES INT BUS FINANCE	10.1016/j.ribaf.2004.02.001	61	3.05
4	GEIGER H	2007	JOURNAL OF MONEY LAUNDERING CONTROL	10.1108/13685200710721881	58	3.41
5	FERWERDA	2009	REV LAW ECON	10.2202/1555-5879.1421	52	3.47
6	GAO Z	2007	JOURNAL OF MONEY LAUNDERING CONTROL	10.1108/13685200710746875	51	3.00
7	SHANAEV S	2020	RES INT BUS FINANCE	10.1016/j.ribaf.2019.101080	48	12.00
8	HLSSE R	2007	ORGANIZATION	10.1177/1350508407080311	44	2.59
9	PELLEGRINA LD	2009	REV LAW ECON	10.2202/1555-5879.1422	42	2.80
10	CANHOTO AI	2021	J BUS RES	10.1016/j.jbusres.2020.10.012	40	13.33
11	VANDEZANDE N	2017	COMPUT LAW SECUR REV	10.1016/j.clsr.2017.03.011	40	5.71
12	SAMANTHA MAITLAND IRWIN A	2011	JOURNAL OF MONEY LAUNDERING CONTROL	10.1108/13685201211194745	37	2.85
13	UNGER B	2009	REV LAW ECON	10.2202/1555-5879.1423	33	2.20
14	FERWERDA J	2013	APPL ECON	10.1080/00036846.2012.699190	32	2.91
15	ARNER DW	2019	EUR BUS ORG LAW REV	10.1007/s40804-019-00135-1	31	6.20
16	NAHEEM MA	2015	JOURNAL OF MONEY LAUNDERING CONTROL	10.1108/JMLC-10-2014-0031	31	3.44

Table 5. Top 16 Most Cited Paper

CONCEPTUAL STRUCTURE OF STUDIES ON MONEY LAUNDERING AND ANTI MONEY LAUNDERING

5.1. Conceptual structure

To explore the main themes and trends in this knowledge base, the researchers conducted a co-occurrence analysis (Figure 6) and illustrated a thematic map (Figure 7). The co-occurrence of keywords has been performed using all data from 1999 to 2023 to shed light on the most popular research topics.

To figure out the popular research topic across all time, this paper considered keywords provided by the authors of each article and the Journal's identification system. The VOS viewer software gathered keywords into clusters regarding their co-occurrence within the same paper. The more frequently some keywords appear together, there are more links between them, and they will be grouped into the same cluster. The researcher set a threshold of 6, meaning a keyword must occur at least six times to be added to this analysis. Finally, the analysis yielded 25 keywords in five significant clusters (Figure 6). After that, the researcher read the abstract of related papers to determine further details about each cluster's theme.

There are clear boundaries between the green cluster (Money Laundering) and the purple cluster (Anti et al.), while many overlap between the other three clusters on the upside. In other words, Money Laundering and Anti Money Laundering are notable topics, while there are replaceable variables underneath the concepts of compliance, laws & regulations, and financial institutions. First, regarding the green cluster of Money

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Laundering, scholars often adopt two popular concepts: organized crime and terrorist financing, as well as the cryptocurrency and FATF standards. Second, the pink cluster Anti Money Laundering shares many common interests, with many studies relying on financial action task force standards, customer due diligence, financial services, and financial inclusion. Research in the yellow cluster primarily focused on compliance with anti-money laundering standards and measures.

The purple rectangle cluster covered more keywords surrounding the status of laws and regulations on anti-money laundering. Besides anti-money laundering, as mentioned in the pink cluster, there are many studies about the financial institutions as a target of money laundering and its status in the blue cluster.

The Sankey flow in Figure 7presents the movement of research focus on this topic over three periods (1999 to 2009, 2010 to 2017, and 2018 to 2023). Scholars have focused on money laundering and terrorism since very early. However, since 2010, research on money laundering has flourished and continuously redefined the notations of Anti-money laundering and its effectiveness.

On the middle side of the figure, from 2010 to 2017, we can see that scholars, along with focusing on Money laundering and Anti Money Laundering, used to study Political Exposed persons (PEPs), Financial Inclusion, and Beneficial ownership. Organized crime and financial crime movements also happened with Anti Money Laundering and Money Laundering.
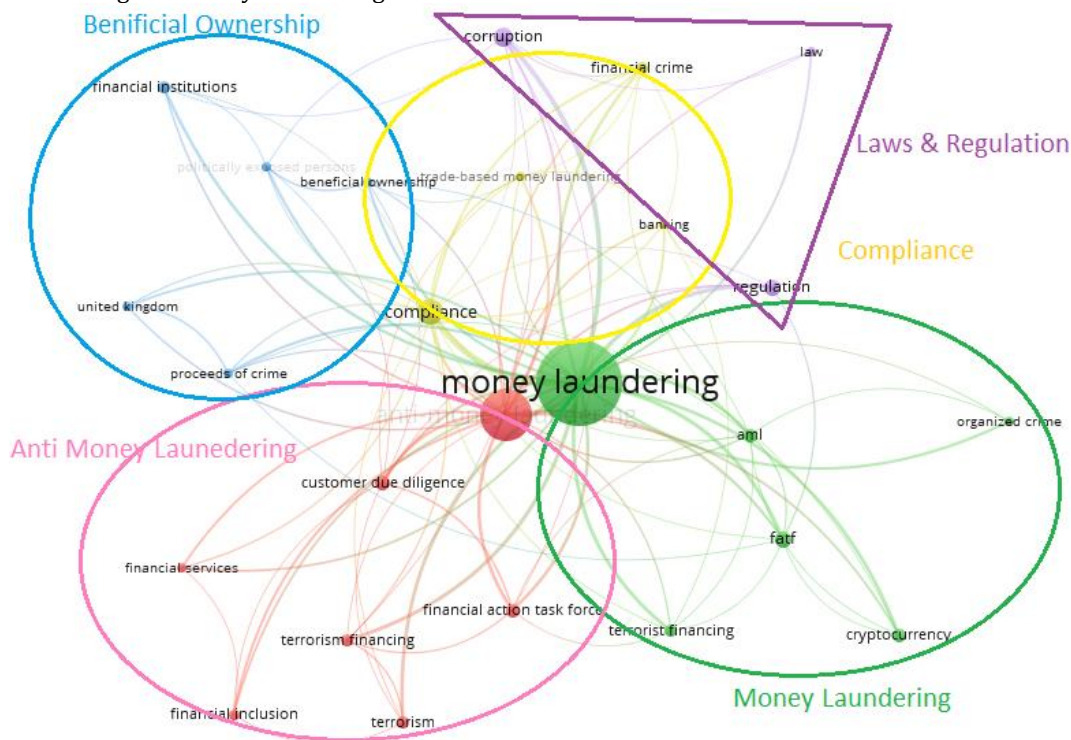

Figure 6. Co-occurrence of keyword network from 1999 to 2023

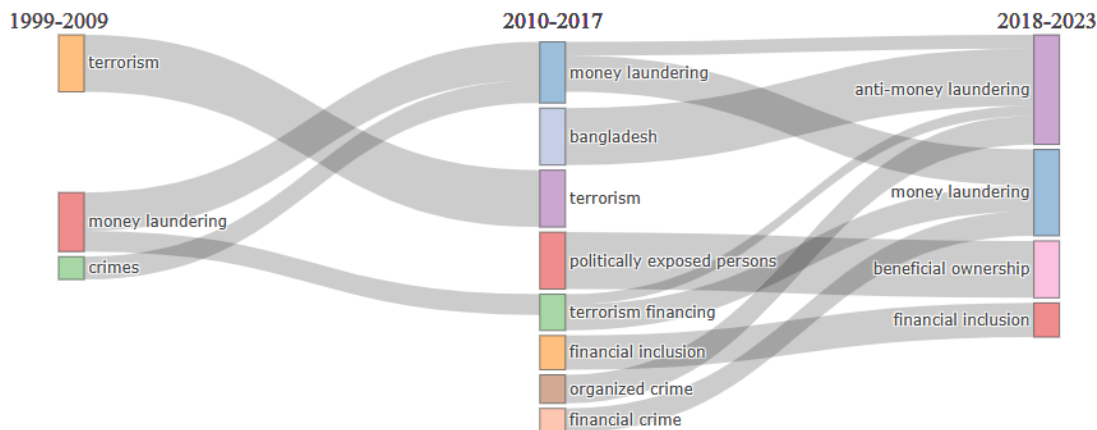**Note:** Minimum time of occurrence: 6; the number of items is 25

Figure 7. Thematic evolution of research focus

CONCLUSION, IMPLICATIONS, AND LIMITATIONS

Given the main aim of investigating the evolution of research on Money Laundering and Anti Money Laundering, considered indexed work in the Scopus database, from 1999 to 2023, this research shed light on three timeframes: 1999–2009, 2010–2017, and 2018–2023. The findings suggested that there has been a steady growth of research on this topic in recent years. Especially since 2017, there have been more and more investigations about Money Laundering Anti Money Laundering, compliance, corruption, financial action task force (FATF), and terrorist financing.

Regarding the first research question about the growth trajectory and sources of publications on this topic, most studies have been published by authors from Europe and Asian societies. The United Kingdom occupied its dominant position in publication, citations, and international collaboration. After Europe and Asia, most of the work was published by authors from African countries. Considering the source of publication, the Journal of money laundering control is the most popular Journal, which started publishing research on money laundering and anti-money laundering in 2004, publishing 189 papers and 954(53.83%) citations. Journal of financial crime is an emerging source with 23 articles, reaching only 175 citations (9.87%).

The second research question highlighted vital authors of this knowledge base: NAHEEM MA., TEICHMANN FMJ, FALKER M-C, MASCIANDARO D, and FERWERDA J. Especially, NAHEEM MAhas 17 articles in the top 10 articles with the highest citations of 157. The two most influential papers are MASCIANDARO D(1999) and DE KOKER L (2013), cited in 97 and 74 publications, respectively.

Regarding the last research question, this study highlighted the sub-topics that attract scholars' attention, including compliance, beneficial ownership, financial action task force, terrorist financing, and customer due diligence.

Furthermore, we clarified the development of those areas across different periods. In detail, from 1999 to 2009, scholars focused on terrorism and money laundering. Also, a few papers mentioned crime within the second period, from 2010 to 2017. Politically exposed persons and financial institutions-related issues became the primary research objects that scholars rely on to study anti-money laundering; the sub-topic of organized crime, financial crime, and financial inclusion also attracted the authors' attention. In recent years, from 2018 to 2023, money laundering and anti-money laundering stills play an irreplaceable facet of this knowledge base. However, scholars concretized the sub-concept of beneficial ownership and financial inclusion; there is a marked increase in research about money laundering and anti-money laundering compliance methods. Besides financial institutions, the focus turns to other targeted sectors such as trade, crypto currency, and professional services.

Overall, this work can serve as introductory material for anyone who wants to know more about money laundering and anti-money laundering. Moreover, this research can be adopted as a Topographical depiction of money laundering and anti-money laundering studies for scholars to build future research designs. However, some defects can be performed differently in future studies. First, we considered the Scopus database only, which limited the number of included works. Further studies can perform similar analyses using other databases with more extensive coverage, such as WoS or Dimensions. Second, the authors considered articles published in English only. Even though it can enhance the convergence of our findings, it also omitted a substantial corpus of technical reports, conference papers, and all types of non-English documents. Third, our search string focuses on money laundering and anti-money laundering only.

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