Review

Anti-money laundering and emerging economy—Evidence from Bangladesh

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Abstract: Money laundering has become a vital issue all over the world especially in the emerging economy over the last two decades. Till now, the developing and emerging countries face challenges about the remedies and inceptions of anti-money laundering issues. The objective of the study is to provide a thorough picture of the diversified movements of academic research on money laundering and anti-money laundering activities all over the world. This study aims at exploring the contemporary issues in Anti-money laundering based on the academic points of view. Further, the study is explored to render a portrayal of anti-money laundering activities from an emergency country context. A review of publicly available reports, published documents, daily newspapers, case studies, and previous academic research comprised the main sources of data for the study. It is found that the contemporary money laundering and anti-money laundering academic research might be classified into four broad categories. An emerging country like Bangladesh has taken little initiative to inductee anti-money laundering initiatives. It implies that for the successful implementation of anti-money laundering activities, good governance along with a congenial regulatory framework is a prerequisite in an emerging country context. In addition, the machine learning may enhance the quality of money laundering detections in Bangladesh.

Keywords: anti-money laundering; Bangladesh; machine learning; governance

1. Introduction

Money laundering becomes one of the major problems for all the economies all over the world over the last decades (Umar, 2023; Zafarullah and Haque, 2023; Zolkaflil et al., 2023). The Global Financial Integrity (GFI) disclosed that the Illicit Financial Flows (IFF) are consistently visible in transactions of 148 developing countries with the developed countries in executing their business and trade related activities (Integrity, 2019). Although money laundering is a global glitches, the developing countries are facing tremendous challenges in dealing with divergent mode of money laundering (Umar, 2023). Due to the existence of ambiguous legal framework, regulatory authorities are struggling in dealing with anti-money laundering issues (Kemsley et al., 2022). While the existing Anti-Money Laundering (AML) is yet to get its saturation, the developing and emerging countries required to liberalize their international trade policies due to explicit and implicit pressure (Sivaguru and Tilakasiri, 2023). Since, Bangladesh is shifting from LDC to developing countries, its economy is shifted from aid to trade (Bhattacharya, 2018; Masum et al., 2020; Masum et al., 2023). To attract the foreign investors to boost up the economy of the country, the govt. soften its foreign trade policy (Bhattacharya,

2018). This liberalization of the trade policy along with the absence of good governance in the economy of Bangladesh creates ample opportunity to the criminals to launder money in divergent unlawful means. This descriptive study has been conducted to identify diversified state of anti-money laundering issues which are visible in both developed and developing countries and lately Bangladesh's scenario has been critically analyzed.

The objective of this study is to conduct a comprehensive review of the current literature on anti-money laundering and its related areas in a global context. The study focuses on gathering information about anti-money laundering research from different sources to gain a good understanding of the effectiveness of anti-money laundering has been explored. In addition, the money laundering activities in Bangladesh have been critically analyzed and corresponding sections plans are proposed in this regard. By analyzing the available literature, the study explores various broad areas of anti-money laundering research, challenges to making an effective framework, and potential problems related to money laundering in the emerging economy. This study will help to make a core base of knowledge that can communicate with law enforcement agencies, policymakers, and other related stakeholders to conduct an effective framework to combat anti-money laundering and thorough an effective way to protect the integrity of the financial system in Bangladesh.

2. Materials and methods

Money laundering is a big concern all over the world. Its impact all over the world both in developed and developing economy is overwhelmingly speeded. Even the nature of money laundering comes into being with diversified nature. The money launders are tends to apply newer approach to accomplish their ill motive. This study is conducted to identify the contemporary issues in money laundering all over the world. The extensive reviews of the literature will help both the regulatory bodies and the academicians to identify the most recent money laundering issues in the current state. And this will further assist the concerned bodies to combat with diversified and emerging money laundering activities of the money launders. The first step of the study involved in conducting searches on ProQuest, Scopus, Google Scholar, and Science Direct databases to identify research manuscripts, cases and reports that contained the keywords "anti-money laundering framework", "money laundering" in their titles, abstracts, or keywords. To gather additional articles, a thorough examination of the cited references within the initially identified papers was conducted. Google Scholar searches were performed to broaden the scope and ensure comprehensive coverage as well as analyze the literature on the anti-money laundering. Similarly, the extent of various money laundering activities in Bangladesh and the role of anti-money laundering activities are stated consecutively. After conducting the initial review of the collected research manuscript of the selected database, further searches were conducted using the keywords found within those. In this case, the additional search keywords used were "money laundering and its effect", "money laundering", "online money laundering", "money laundering and Bangladesh" and "anti-money laundering framework". This recurrent process of

searching based on keywords helps to uncover more relevant articles that may have been missed in the initial search, ensuring a comprehensive analysis of the literature on Anti-money laundering. The database search terms that served as the foundation for this evaluation are presented in **Table 1**.

Table 1. Database and string used to search anti-money laundering issues.

Database	Search string	Date of access	Results
Pro-Quest	Anti-money laundering framework	2 April 2023	58,171
Scopus	Anti-money laundering framework	4 April 2023	5650
Science Direct	Anti-money laundering framework	4 April 2023	1059
Google Scholar	Anti-money laundering framework	4 April 2023	35,400
Pro-Quest	Money laundering	5 April 2023	1,092,182
Scopus	Money laundering	5 April 2023	585
Science Direct	Money laundering	5 April 2023	4544
Google Scholar	Money laundering	5 April 2023	273,000
Pro-Quest	Online money laundering	10 April 2023	229,175
Google Scholar	Online money laundering	10 April 2023	208,000
Scopus	Online money laundering	11 April 2023	235
Science Direct	Online money laundering	11 April 2023	2544
Pro-Quest	Money laundering and Bangladesh	18 April 2023	29,444
Google Scholar	Money laundering and Bangladesh	18 April 2023	20,400
Science Direct	Money laundering and Bangladesh	18 April 2023	211
Scopus	Money laundering and Bangladesh	18 April 2023	62,194
Google Scholar	Money laundering and its effect	26 April 2023	146,000
Pro-Quest	Money laundering and its effect	10 June 2023	194,715
Scopus	Money laundering and its effect	15 June 2023	61,585
Science Direct	Money laundering and its effect	15 June 2023	64,544

3. Findings and discussions

3.1. Contemporary thoughts on anti-money laundering (AML)

Based on the literatures, the trend s of researches on the anti-money laundering activities can be classified into four broad categories namely—magnitude of money laundering, requirements of anti-money laundering framework, effect of money laundering on the economy, and detection of money laundering.

3.1.1. Extent of money laundering

A good number of researchers explored numerous studies to identify the volume of money being laundered and to explore the process used to lauder the money (Barone and Schneider, 2018; Ferdousy, 2022; Ferwerda et al., 2013; Ghulam and Szalay, 2023; Hassan and Schneider, 2016; Medina and Schneider, 2019; Tiwari et al., 2020; Umar, 2023). There are various measurement methods in determining the volume of money laundering like, International Money Fund (IMF) shadow economy, World Bank Residual Model, un-official economy approach, tax evasion approach. Each of the above bodies defined the extent of money laundering in their

own way. The core concepts of these measurement techniques are summarized in **Table 2**. In addition, the academic researchers used case study, proxy variable and economic models to determine the extent of money laundering. For an instant, GDP, worldwide proceeds of crime and the discrepancies of the balance of payment can be used as the proxy variables in determining the volume of money laundering. Moreover, there are various economic models like, dynamic two-sector model, walker-gravity model might be used to determine the value of money laundering.

Table 2. Measurement of money laundering (Kaufmann and Kaliberda, 1996; Kemsley et al., 2022).

Measurement methods	Core concept
IMF shadow economy	This method is one of the renowned methods approached by the IMF most often. Shadow economy includes all economic activities hidden from official authorities for monetary, regulatory, and institutional reasons. These methods view money laundering as the value of undisclosed items in the form shadow economy.
World Bank residual model	This idea is based on cross-border financial transactions that are illegal. Money laundering (ML) is considered to be present when there are notable differences between the origins (inflows) and uses (outflows) of monies in a nation.
Unofficial economy (UE) approach	The economic activity method was created as a way to evaluate the economic activities, both official and unofficial, occurring inside a nation. This method views the consumption of electricity as the most accurate physical measure of total economic activity, encompassing both official and unofficial economic activities.
Tax evasion approach	This method views money laundering (ML) as a possible result of tax avoidance. When money is purposefully or unfairly omitted from the tax authorities, laundering is usually necessary to hide its origins and give the impression that it is true.

3.1.2. Requirements of anti-money laundering framework

From the reviews of the literature, it becomes apparent that that a precise and crystal framework may guide the regulatory bodies in combating with the diversified and emerging issues of money laundering (Tiwari et al., 2020; Zolkaflil et al., 2023). There are diversified views and findings on the legislative role in implementing various anti-money laundering initiatives (Tiwari et al., 2020). These inconclusive findings on anti-money laundering framework persuade the academicians and regulatory bodies to move for further study to bring a sustainable conclusion in the legitimacy of the anti-money laundering frameworks. The Financial Action Task Force (FATF) is founded by Group and countries in 1989 to combat global problems relating to launder illicit wealth earned from production and sales of narcotics (Tiwari et al., 2020). The FATF further extends the scope of money laundering regulations as per the requirements of the prevailing situations (Unger, 2013). From the context of security governance, Jakobi (2018) explored that the Anti-money laundering precisely represents the components of governance based on the conventions of FATF. However, Pol (2018) assessed the effectiveness of the conventions and legislative issues of the FATF in focusing with the anti-money laundering practices. He explored that FATF conventions, regulations and controlling mechanisms to protect money laundering issues are inadequate and insufficient. The lacking of this holistic approach of money laundering has led the acceleration in changing the landscape of incorporating a universal anti-money

laundering framework (Bozhilova, 2018). For instance, a fifth anti-money laundering directive had been proposed to overcome the loopholes in money laundering regulations and policies (Bozhilova, 2018).

3.1.3. Effect of money laundering on the economy

Money laundering is a process of converting the black money to the white money. It is a way of reconciling the illegal money. Money laundering has adverse effect on the economy of any country (Alsuwailem and Saudagar, 2020; Syed Mustapha Nazri et al., 2019). It destroys the financial institutions, promotes corruptions, distorts the market competitions, reduces investment and brings many more implicit and explicit adverse impact on the economy of a country. Money laundering is the third largest business in the world that covers 2.5% of the GDP (Alsuwailem and Saudagar, 2020). The IMF also estimated that around 2% to 5% of the world GDP results from money laundering (Syed Mustapha Nazri et al., 2019). This large positioning of money laundering induces the ill people to put more concentration on money laundering issues across the world. Therefore, not only the developing country but also the developed country faced tremendous challenges in dealing with the money laundering issues. The Global Financial Integrity also reports that the Illicit Financial Flows are steadily observable in transactions of 148 developing countries with the developed countries in implementing their business and trade allied undertakings (Integrity, 2019).

3.1.4. Detection of money laundering

From the literature of money laundering, it is explored that detection of money laundering is still a crucial topic yet to be explored. From the context of Fifth Industrial Revolution, machine learning can be a vital way to detect money laundering by using various algorithms such as Apriori (Dreżewski et al., 2015; Suresh et al., 2016), PrefixSpan, FP-growth, Eclat Stacked auto-encoder (Dreżewski et al., 2015; Mubalaike and Adali, 2018), Restricted Boltzmann machine (Mubalaike and Adali, 2018), Gradient boosting (Jullum et al., 2020), Temporal-directed Louvain algorithm (Zhou et al., 2017), etc. Machine learning systems can be classified into supervised or unsupervised learning. Supervised machine learning is similar to learning with a teacher. Its objective is to estimate the value of an outcome measure focused on several input measures (Getoor et al., 2001; Kumar et al., 2022). Whereas unsupervised machine learning is similar to learning without a teacher. The objective of unsupervised machine learning is to depict the relationship and patterns among a set of input measures. However, the imbalances in class and the lack of data availability are a big challenge for machine learning to achieve success in anti-money laundering initiatives (Jensen and Iosifidis, 2023; Zhang et al., 2003). To overcome the class imbalance problems a multitude of augmentation methods may be adopted whereas if flabbergasted by the availability of public data synthetic data generation may be a viable procedure (Jensen and Iosifidis, 2023).

3.2. Money laundering and Bangladesh

Bangladesh, a least developed country, has set its sights on attaining the status of a "developing country" by 2026 (Masum et al., 2020; Masum et al., 2021; Zafarullah and Haque, 2023). In 2021, its GDP was estimated at $416.26 billion by

the World Bank, making it a considerable economy in the South Asian rejoins. Bangladesh's geographical area with long porous borders along the west, east, and north, as well as its open sea in the south, exposes the country to various illicit activities. The country's strategic location makes Bangladesh vulnerable to smuggling operations, where illegal goods are trafficked across the borders and drug trafficking. Bangladesh, like many other countries, has faced big challenges due to the COVID-19 pandemic (Hossen et al., 2023). The economy has been affected, with a slowdown in GDP growth, and faces disruptions in international trade and highly reduced international transactions (Hossen et al., 2023). The pandemic has also exposed existing inequalities and vulnerabilities within the country (Hossen et al., 2023). Some constant governance issues, like bureaucratic pathology, low transparency and accountability, high levels of corruption, an ambiguous regulatory environment, unprotected financial operations, a disorganized banking sector, interest conflicts, careless oversight and reporting, flawed risk assessment, and poor policy enforcement, have had a big impact on the nation's efforts to establish an effective AML regime (Ferdousy, 2022; Rahman et al., 2015; Zafarullah and Haque, 2023).

According to the World Bank estimates, the GDP of Bangladesh was $460.20 billion during the year 2022 which showed a second highest in the South Asian region (World Bank, 2024). It was estimated that during the year the GDP had a growth of 7.1% (World Bank, 2024). It is a matter of great sorrow that such a boasting economy had to face a syphoned out of 20% of its GDP between the year 2005 and 2014 (Zafarullah and Haque, 2023). Many Bangladeshi individuals including high level political connections, bureaucrats, owns of dummy companies, dummy entrepreneurs, police officers, retired army personnel and their relatives had been charged for having amassing ill-gotten wealth by means of bribery, fraud, money smuggling and black money holding (Waris and Khan, 2013). Even some Bangladeshi citizens are exposing international financial crimes committed through offshore companies as disclosed in the scandals of Panama and Paradise Papers. In addition, deposits in Swiss bank from Bangladesh are roaring in recent days (Zafarullah and Haque, 2023). During the year 2023, the loan defaulters in the banking sectors climbed to 20.7% by BDT 145,633 crore or around $12.342 billion. These adverse scenarios of the financial institutions as well as economy of the country cannot be getting rid of without adopting congenial policies of anti-money laundering issues. Like the other countries, Bangladesh also has to comply with the guidelines of the FATF (Haq et al., 2021). Besides the conventions of FATF, Bangladesh acceded to various international conventions concerning to the AML frameworks like UNICSFT on 2005, UNCC on 2007, SAARC Conventions on MACM on 2008, Palermo Convention on 2011, etc. (Ahmed, 2017). However, Zafarullah and Haque (2023) found that like the other South Asian countries Bangladesh is still struggling to comply with global standards on money laundering.

Haq et al. (2021) explored that the regulatory response of Bangladesh in complying with the recommendations with the FATF is dominated by wait-and-see policy rather proactive risk based approach. However, Ahmed (2017) explored that internal structural development in Bangladeshi governance system along with the social and economic issues are the prerequisites of the successful implementations of

the AML framework. Zafarullah and Haque (2023) found that unregulated financial operations, privation of transparency and accountability, abstruseness in regulatory environment, anarchic banking sector and extreme corruptions hinder the performances of AML systems in Bangladesh. Ferdousy (2022) also found that corruptions and lack of good governance bring disaster in the money laundering scenario of the country. From the previous studies on money laundering, it becomes apparent that the obstacles of the successful implementations of AML system are relatively common. This descriptive study will help the top regulatory bodies of the country to identify the major hindrances of the implementations of the AML systems. However, from the literatures in the developed country and emerging economy it is recommended that the machine learning can assist the regulatory bodies of the country to detect the money laundering issues promptly. And these quicker detections will assist the regulatory bodies to take more corrective actions in this regard.

4. Conclusion and scope for further study

The study focuses on gathering information about anti-money laundering research from different sources to gain a good understanding of the anti-money laundering issues all over the world. It depicts how money laundering impacts the anti-money laundering framework and different aspects. Based on various conventions, regulations, and guidelines of the money laundering issues, the study draws attention to the present literature and establishes the basis for future studies to develop new ways of enhancing Bangladesh's anti-money laundering system. Despite of having economic booming in Bangladesh, it is a matter of great sorrow that such a boasting economy had to face a syphoned out of 20% of its GDP between the year 2005 and 2014 (Zafarullah and Haque, 2023). During the year 2023, the loan defaulters in the banking sectors climbed to 20.7% by BDT 145,633 crore or around $12.342 billion. Additionally, the paper focuses on identifying various hindrances that hamper the successful Implementations of the AML in Bangladesh. Unregulated financial operations, privation of transparency and accountability, abstruseness in regulatory environment, anarchic banking sector and extreme corruptions hinder the performances of AML systems in Bangladesh (Ahmed, 2017; Ferdousy, 2022; Haq et al., 2021; Solaiman, 2018; Zafarullah and Haque, 2023). To protect the financial system and prevent criminals and terrorists from money laundering, the findings of the study will assist in detecting ill-gotten gains or finance. The study also assists the regulatory bodies to turn the AML framework into more active and goal-oriented tools, and better able to fulfill the objectives in combatting money laundering successfully by analyzing the areas and categories of the money laundering activities. Governmental entities, financial institutions, and law enforcement agencies must work together more honestly, closely, and consistently share information to boost the work and effectiveness of anti-money laundering initiatives.

To establish a robust anti-money laundering framework in Bangladesh, it is imperative to engender a dynamic amalgamation of comprehensive legislative reforms and technologically innovative enforcement strategies. Machine learning can

be a vital way to detect money laundering in the context of Bangladesh. Precisely, supervised machine learning is best suited in the context of Bangladesh as most of the regulatory bodies lack substantial knowledge in machine learning. Therefore, machine learning through teacher is best appropriate for Bangladesh. Moreover, the objective of such machine learning is also consistent with Bangladeshi context as it is used to estimate the value of an outcome measure focused on several input measures (Getoor et al., 2001; Kumar et al., 2022). By implementing an integrated database design utilizing advanced data analytics tools also using updated technology and consistently following the internationally updated acts, it is possible to increase the early identification of shady financial activity and consequently reduce the flow of illicit cash. Moreover, a stronger focus on capacity development and skill enhancement is required to achieve the convergence of technology and human knowledge. Also, the government can focus on effective Workshops, training courses, and group seminars that may provide professionals with in-depth knowledge of new money laundering typologies, and anti-money laundering frameworks enabling them to react swiftly to emerging risks.

Overall, the study sets the tone for further research work to be carried out in the area of anti-money laundering and money laundering, which is currently doing substantial damage to economies all over the world. The outcome of this study creates several opportunities for future researches. Firstly, the attributes of good governance assisting AML in business entity especially the banking and financial sector can be analyzed further. Secondly, the regulatory body's perception to use machine language in solving money laundering issues in Bangladesh can be investigated further. Thirdly, the corporate disclosure practices on money laundering or anti money laundering issues can be critically analyzed from their published financial reports. Lastly the association between the corporate AML disclosure and the profitability of a firm can be examined.

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