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The effect of the banking supervision on anti-money laundering

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ABSTRACT

This article's goal is to investigate the connection between banking supervision (BakSup) and anti-money laundering (AnMeyLg). The study's hypothesized model was examined using a survey questionnaire research methodology. The Central Bank of Sudan and the compliance departments of Sudanese banks provided the information. Just 247 valid surveys were received out of a total distribution of 450 questionnaires. The partial least squares method for structural equation modeling was applied. The statistical findings supported the impact of banking supervision on anti-money laundering. In-depth discussions of the study's specifics and consequences were included at various points. There are several real-world applications of the findings of this study. Management can use the findings to guide their decisions on whether or not to establish anti-money laundering procedures in their banking firms. Banking supervision may provide managers with effective anti-money laundering strategies for maximizing bank performance and maintaining market share. This is one of the few empirical studies of its kind that looks at how banking supervision affects efforts to combat money laundering.

Contribution/Originality: This study is one of a relatively small number that used partial least squares structural equation modeling (PLS-SEM) to examine the impact of banking supervision on anti-money laundering in Sudanese banks. The main contribution of the paper is the discovery of a positive relationship between bank supervision and money laundering.

1. INTRODUCTION

One of the important questions in the field of banking is how banking supervision affects control and improvement of banking work (An, Bushman, Kleymenova, & Tomy, 2023). Banking supervision affects the commitment of banks to combat all financial crimes, not only anti-money laundering and terrorist financing; it is also added to the tasks of banking supervision by identifying shortcomings in the practices of the executive management of commercial banks, including operating procedures and policies and internal governance structures.

For example, after switching to a more stringent banking supervision regime with sanctions (Huang & Thakor, 2022).

Many commercial banks in this era are facing increasing levels of regulatory and non-regulatory challenges, especially those working in developing countries. They struggle to get a good reputation and stay in business (Bakhos Douaihy & Rowe, 2023). Every year, huge amounts of money are obtained from illegal sources and criminal activities, and this money is usually laundered through the use of banks and financial institutions (Wongwishyakorn, 2023). The economic gains derived from criminal actions bear resemblance to those obtained through legal operations, although with the notable distinction that the former funds are not readily expandable or employable. Criminals have devised a means to address this predicament by engaging in money laundering, enabling them to utilize and profit from the proceeds derived from illicit and questionable undertakings. "Money laundering" is a term derived from mobster Al Capone. Whoever attempts to transfer his illegally obtained gains through money launderers to evade accountability and make these gains appear legal (Ferwerda, 2009). Money laundering means disguising the source of illegal funds acquired through criminal operations and converting them into legal funds in order to avoid prosecution. This money is laundered around the world through construction, real estate investments, luxury vehicles, and other luxuries (Durguti, Arifi, Gashi, & Spahiu, 2023).

In recent years, a number of commercial banks have been penalized or cautioned for their failures to manage money laundering risks. For example, one bank of London-based Hong Kong and Shanghai Banking Corporation (HSBC) was punished by nearly $2 billion because it failed to prevent Mexican drug traders and other traffickers from using it as a tool to launder money of illicit origin (Isa, Hoque, Sanusi, & Haniff, 2023) The international anti-money laundering and terrorist financing framework is based on the forty recommendations issued by the Financial Action Task Force (FATF). In this framework, all countries should establish a banking supervision system to monitor and urge commercial banks to comply with anti-money laundering controls (Jensen & Iosifidis, 2023). The framework also requires commercial banks to:

(A) Financial institutions must assess the risks resulting from money laundering and terrorist financing. Therefore, comprehensive risk management to prevent money laundering should be considered an integral part of the good practices and policies of a commercial bank, as it is an ongoing process that makes it possible to identify potential loss events. For this reason, strategy and risk appetite are determined to provide reasonable security for achieving business objectives. Having a “methodology for identifying and evaluating risks in preventing money laundering” also means that commercial banks have an internal organization system that defines responsibilities, the degree of interdependence between the areas involved, and the degree of exposure to money laundering risks. Thus determining the risks that commercial banks are willing to take in developing their corporate purpose (De La Haza Barrantes, Aguedo Huiza, & Rosales Vicente, 2018).

(B) Customer Due Diligence (CDD) by due diligence, we mean the implementation of a number of procedures that include identifying the customer through his identity and verifying it using the original documents, reliable, correct information from independent sources such as government agencies, and obtaining and verifying the identity of any person authorized on behalf of the client, including evidence of authorization or any document showing that this person is authorized to act in this transaction on behalf of another person. Identify the real beneficiaries and take all measures to identify them and understand the ownership structure of legal entities. It also includes understanding and obtaining information and documents supporting the purpose of any transaction conducted by the bank (Chitimira & Munedzi, 2022).

(C) Cases requiring special measures: (politically exposed persons, correspondent banking, wire transfers, new technologies). The real beneficiary is any natural person who owns the funds or has the ability to dispose of them and eventually benefit from them. The literature identifies political persons (PEPs). Individuals on the job with a prominent public position in the state or large companies and high ranks in the security services have opportunities

to be involved in corruption and money laundering. This is why AML controls and regulations focus more on high-risk clients (Jacopo, 2022).

(D) Bookkeeping and record-keeping. (E) Reporting suspicion transactions, most commercial banks have tools to identify normal operation, abnormal operation, and suspicious transaction, based on laws, knowledge, and personal experience with illicit money activity. For instance, one of the alleged money laundering schemes involves shifting money from large to small or vice versa (Dumitrescu, Băltoiu, & Budulan, 2022).

Tax evasion also falls within the category of the shadow economy, whereby taxes are evaded on legal activity, which turns it into illegal and therefore linked to money laundering, as well as the secret economy involved in illegal activity. Both are necessary to achieve the goals of money launderers. It is difficult for economies to determine the origin of a transaction when dealing with the formal, informal, and illegal sectors at the same time (Javaid & Arshed, 2022).

The efficacy of the effort to stop money laundering depends on how well commercial banks comply with the Central Bank's directives to stop money laundering and terrorist funding. According to prior research, commercial banks in some countries respond quickly to AML or combating the financing of terrorism (CFT) orders from the central bank. The strength of the central bank's banking supervision is demonstrated by the commercial banks' rapid execution of AML/CFT instructions. The findings of several earlier studies also demonstrated the presence of successful collaboration between banking oversight, commercial banks, and government agencies with expertise in countering money laundering and terrorist financing to improve the efficacy of compliance with such measures (Zyadat, 2022).

In order to give researchers and business professionals a technical overview of the literature on AML statistics and research methodologies in commercial banks, we have focused on the impact of banking supervision on AML in commercial banks in this study. The following are the contributions of the researchers:

Firstly, many of the previous studies focused on banking supervision in developed countries, such as the study (Apetri, 2015; Budinska, 2019; Munin, 2016; Wissink, 2017). Few studies have dealt with the anti-money laundering system in developing countries, such as this one (Chitimira & Munedzi, 2022). The study examined the role of technology in the development of new financial markets and growth of current markets, as well as its impact on facilitating domestic and international payments. The effective use of technology can enhance the enforcement of financial market laws by combating financial crimes. This enhances the integrity of financial markets and their sustainability. Countries around the world have struggled to adhere to the recommendations of the International Financial Action Task Force to Combat Money Laundering and Terrorist Financing (AML/CFT). Due to weak financial market laws and poor detection of money laundering cases due to insufficient mechanisms and resources, developing countries have so far failed to make satisfactory progress in adopting and implementing appropriate measures to mitigate money laundering risks in accordance with the recommendations of the International Financial Action Task Force (FATF). This is evidenced by the increase in suspected money laundering cases in the financial markets. Weak application of financial market laws led to poor liquidity and stock market efficiency. Hence, the sustainability and integrity of the financial market have been compromised.

Secondly, the majority of researchers studied the role of banking supervision in the banking sector in general without specializing in combating money laundering, such as in a study (Dziawgo, 2021). The paper Buttigieg, Efthymiopoulos, Attard, and Cuyle (2019) examines the framework for regulating crypto assets in Malta, with a particular focus on combating money laundering and the financing of terrorism and how to treat it. To this end, the paper argues that the Maltese framework is better for anti-money laundering than other countries' anti-money laundering controls. The paper also argues that the Maltese framework can serve as a model for AML regimes in other countries. Finally, the paper outlines recommendations on actions that can be taken at the state and EU levels in order to address the money laundering and terrorist financing risks associated with crypto assets.

Thirdly, the anti-money laundering (AML) regulations created in the US are modified in the UK to meet the requirements of the local financial services sector. Following 1987, money launderers were still able to operate in both the US and the UK in a setting that made it simple for them to conceal and use filthy money. The researchers looked into six months' worth of private letters and never-before-seen papers that were sent and received within the UK government in 1987. From their research, they draw the conclusion that the protection of national business interests and influence on both sides of the Atlantic and the prevention of drug money laundering, theft, and trafficking are at the heart of the present global AML system. Anti-crime legislation will be devised, amended, and changed in an effort to safeguard these interests as well as those of the nation and the banking and financial industries in the United States and the United Kingdom. The document was transferred to the National Archives as an archived record in compliance with the Public Records Act and the Freedom of Information Act, and it was retained by the UK Treasury while it was classified confidential until it was made public in 2017 (Young & Woodiwiss, 2021).

2. LITERATURE REVIEW AND DEVELOPMENT OF HYPOTHESES

In the ten-year period that followed the global economic crisis of 2008, major changes occurred in the standards of banking supervision over commercial banks, as financial institutions whose stability affects the stability of the financial system and the economy as a whole in the country. The Bank for International Settlements standards were revised, and new Basel Committee 1, 2, and 3 standards emerged, improving certain sectors of the previous standards with regard to issues of capital requirements, internal risk management systems, transparency of bank operations, and anti-money laundering aspect. The improvement of standards for banking operations also affected changes in EU law sources related to the regulation of the establishment, operation, and supervision of banks, such as Directive 2013/36/EU and Regulation (EU) No. 575/2013 in 2013, which largely took over the requirements of Basel III (Atlagić, 2020). Through the Great Recession, it has been proven beyond any doubt that the ability of banking supervision and the Federal Reserve to help stabilize the general level of prices and limit the elimination of unemployment depends decisively on the strength of banking supervision, which leads to the stability of the financial system and thus achieving the desired goals (Schellhorn, 2020).

The central bank is widely regarded as an ethical entity that seeks to implement the monetary and financial policies of the state, hence exerting control over the economic dynamics inside the nation and providing supervision over the banking sector (Al Jabouri, Al-Yasiri, & Al-Akili, 2023). Banking control is considered an administrative process through which the safety of the situation within commercial banks is ensured as planned and supports the achievement of objectives, as it includes ensuring that banking operations comply with the established controls and objectives, and in the event that they are inconsistent, the deviation is addressed (Padidar & Meschian, 2014).

Banking supervision is a type of regulatory oversight to identify the extent to which banks' strategies are implemented, i.e., the extent of their success in reaching their goals and objectives, by comparing what has been actually implemented with what is planned and modifying the strategy based on the results of implementation in order to improve the organization's ability to achieve its goals. Finally, Radomska (2014) mentioned that commercial banks were mostly only interested in the wealthy, and for the sake of developing the economy, the banks were forced to deal with ordinary customers and depositors as well. Until countries reached a certain stage and with the development of the economy, commercial banks were increasingly used by small customers (deposit, borrowing, transfer, and foreign exchange). Information asymmetry between banks and their customers has emerged, prompting many stakeholders, including bankers, customers, depositors, and shareholders, to introduce formal banking supervision. Thus, the level of compliance of the bank with the controls and instructions of the central bank should be examined. The relationship between commercial banks and the government is another important factor. Commercial banks were allowed to issue their own banknotes, subscribe to huge sums of national

bonds, and contribute to national development projects. Hence, the need for banking supervision emerged (Hotori, Wendschlag, & Giddey, 2022).

Banking supervision is defined as part of a comprehensive legal framework for the banking sector and includes the designation of regulatory and supervisory authorities and field control over the extent of implementation of legislation that limits the level of risks to which commercial banks are exposed. As well as the precautionary banking supervision, which occupies an office by receiving returns from the banking sector (Apetri, 2015). According to the aforementioned, the researchers are of the opinion that banking control is an administrative procedure that senior management uses to keep an eye on all strategic management components, evaluate performance, and take corrective action in accordance with a set of sequential steps aimed at improving the bank's strategy as intended.

That banking supervision contains provisions that require commercial banks to improve internal and administrative controls. and that it can enforce action against problem banks, and if the bank fails to meet the requirements of the order, the Banking Supervision can enforce the order by imposing financial penalties, terminating deposit insurance, or taking further action that may lead to the closure of the bank (An et al., 2023). The banking supervision system focuses on the basic and vital issues and basic variables that are decisive in determining the success or failure of the banks (Radomska, 2014). To be limited to the minimum amount of information necessary to give a true picture of the events, and to move away from the traditional failure in the fact that the oversight system provides a huge amount of information (Delgado & San Andrés, 2009). To provide decision-makers with the required information in a timely manner in order to take corrective action in a timely manner by generating an early feedback system on problems (Padidar & Meschian, 2014). That the supervision system be effective from an economic and financial point of view to achieve the objectives (Khaled, Lauer, & Reille, 2006). To be flexible enough for the supervision mechanism to operate efficiently even if plans are modified (Padidar & Meschian, 2014). The Basel Committee on Banking Supervision has prepared the basic principles for effective bank supervision. These principles cover most aspects of the practice of banking supervision. Moreover, these principles refer to many concepts related to banking control, such as corporate governance, internal control and internal auditing in commercial banks, and the appointment of a compliance officer (Ampudia et al., 2019). Based on the aforementioned information, the researchers assert that the efficacy of the financial supervisory system hinges upon the timely provision of essential data, which empowers decision-makers to proactively address potential concerns.

Since ancient times, researchers, academics, and policymakers have discussed the concept of money laundering. Money laundering is an old concept. The practice originated more than 2,000 years ago when Chinese merchants tried to convert their illicit money into legitimate money to evade legal prosecution (Gilmour, 2022). Money laundering as an international crime appeared a long time ago, to be precise, since 1930 in the United States (Fauzia & Hamdani, 2022). To study money laundering, it should be clear which funds from a legitimate source and which funds from an illegal source in the literature are money laundering (Kramer, Blokland, Kleemans, & Soudijn, 2023). The International Financial Action Task Force (FATF) (2012) defines money laundering as the processing of proceeds of crime to conceal their illegal source (Opudu & Ogoun, 2023); the Sudanese Anti-Money Laundering Act of 2014 defines money laundering as: (1) Anyone whose conduct involves acquiring proceeds, possession, disposal of, use, transfer, administer, keep, exchange, deposit, or investment by defrauding its value, movement, or lead to conceal, camouflage its source, true nature, place, way of disposal, ownership, or rights relating thereto—regardless of whether the offence from which proceeds resulted—is considered to have committed money laundering. (2) Anybody who collects money or provides it indirectly or directly for the conduct of terrorism or who works with terrorist organizations or terrorists is considered to have committed the crime of terrorism funding. Any conduct that violates the Terrorism Combating Act of 2001 or any legislation that replaces it, as well as any act of terrorism that violates a treaty to which Sudan is a party, is considered a terrorist act. (3) Anyone who attempts or criminally

agrees to or participates in, abets, or assists in the commission of any of the offences specified in this chapter will be punished with the punishment specified for the primary offender.

Money laundering is the process of concealing the source of illegitimately and illegally obtained funds by passing them through a complex chain of banking or other commercial transactions (Zyadat, 2022). Money laundering is the process of converting the proceeds of criminal activities into clean money that appears to come from a legitimate source. In other words, it puts money obtained from illegal sources into the natural financial cycle or into the process of money circulation within the economy by disguising governments, and making them appear as clean money, and using them for various purposes (Lokanan, 2022).

The money laundering process goes through three stages (Ahmed & Ahmed, 2021):

(A) Substitution stage: the initial phase of money laundering is sometimes referred to as the "deposit" step. The process through which funds derived from illicit activities is integrated into legitimate financial systems. After obtaining money from an illegal source through any crime (theft, bribery, corruption. etc), financial criminals move the money from its illegal source. It is where criminal money is "laundered" and hidden by being put into a legitimate financial system (banks), as in bank accounts (Murrar & Barakat, 2021).

(B) The camouflaging and covering stage: this stage is concerned with concealing the source of illegal funds through the implementation of a series of successive financial operations. It is of great importance for money laundering operations in order to create complex and multiple layers of commercial deals and banking operations that ensure the concealment of illegal proceeds, disguising their source, and completely cutting off their link to criminal activity to avoid being tracked by the law. And giving full opportunity to use it freely for various purposes, as if it came from a legitimate source (Ahmed & Ahmed, 2021).

(C) The third and final stage of the money laundering process is called the consolidation stage. During this stage, the money is returned to the criminal (the owner of the money), and it becomes as if it were from legitimate sources. After the proceeds of crime are fully integrated into the financial system (banking), they can be used for any purpose, having initially been placed as cash and layered through many multiple commercial and banking transactions (Matanky-Becker & Cockbain, 2022).

The financial system, including the banking system, is the main channel for money laundering (Issah, Antwi, Antwi, & Amarh, 2022). Money laundering harms the stability of banks and the entire financial system (Mekpor, Aboagye, & Welbeck, 2018). Previous studies also indicated that money laundering corrupts the financial market and the national economy and reduces customer confidence in the financial system and banks. Money laundering involves significant risks represented by financial, operational, and reputational risks of financial institutions (Issah et al., 2022). To mitigate the risk of money laundering, banking supervision is used as a tool. Banking supervision relies on off-site supervision and on-site inspection to monitor the extent of the banking system's commitment to combating money laundering and mitigating its risks (Lo, Layeghy, & Portmann, 2022). Therefore, effective money laundering controls and effective banking supervision are expected to instill customer confidence in the financial system and banks and are also expected to promote the development of the national economy (Ofoeda, Agbloyor, Abor, & Osei, 2022). New Payment Methods (NPMs), which represent modern ways of completing banking and financial transactions, are considered money laundering and funding risks and therefore should be carefully considered by commercial banks as well as monitored by banking supervision (Akartuna, Johnson, & Thornton, 2022).

According to Bermpei, Kalyvas, and Nguyen (2018), who examine the role of institutional quality and banking supervision on the stability of banks the study uses a sample of about 1050 commercial banks from 69 emerging and developing economies during the period from 2004 to 2013 on the stability of the commercial bank. The researcher also measured the Z-Score. Strengthening the fight against corruption also has a positive impact on activity restrictions and stability. And that the regulation of capital and banking supervision has an effect on stability, and that the institutions are of high quality, and that the researcher did not find strong evidence that the negative

impact of banking supervision on the stability of the commercial bank is conditional on the institutional quality. The breakdown in the z-Score showed that the quality of institutions conditioned the impact of banking regulations on financial stability more by influencing earnings stability than by influencing earnings capitalization (Bermpei et al., 2018). Moreover, Apetri (2015) examines the role of the Romanian National Bank in regulating and supervising commercial banks in Romania, and analyses the measures implemented by the Romanian National Bank after the global financial crisis of 2008 until now, and identifies the challenges faced by the Romanian National Bank on the basis of the changes the European Union is making in the supervisory framework for the banking sector. In addition, Dziawgo (2021), tests the hypothesis that SupTech has become an innovative tool for banking supervision and is expected to have a large and growing role in the supervision of commercial banks. Previous empirical research analyzed the available data. The study reached a set of results, including the increasing demand for SupTech solutions due to the presence of unstructured data, the great complexity of the data, limited resources in countries, and identifying potential new risks in the sector. And those SupTech solutions are applicable in many areas, such as reporting, data management, and behavior analysis. Case studies from Austria, Rwanda, Singapore, and Italy show that central banks are able to either collaborate with banks or technology companies or develop infrastructure themselves. It can be concluded that both banks and supervisory authorities aim to reduce the cost and time of the supervision process by using new technologies. Successful implementation of SupTech solutions can increase the efficiency of the banking supervision process (Dziawgo, 2021).

According to Mekpor et al. (2018), who measure compliance in combating money laundering and terrorist financing (AML and CFT) and identify its determinants, using the recommendations of the International Financial Action Task Force (FATF) and assigning weights to these recommendations, the study calculates a measure of compliance with AML. The determinants of AML compliance were investigated using Ordinary Least Squares (OLS) data for 155 countries from 2004 to 2016. The results of the study indicate that AML compliance has improved slightly over the past. The results of the OLS regression show that technology, business openness, regulatory quality, IFC, and bank focus significantly determined and improved AML compliance (Mekpor et al., 2018).

Moreover, according to the study of Chitimira and Munedzi (2022), who aim to examine and discuss existing AML and CFT laws to explore flaws and loopholes to address them in Nigeria. The article analyzes the regulation and combating of money laundering and terrorist financing activities in Nigeria. The method of doctrinal and qualitative research is used to explore the gaps and flaws in the Nigerian AML and CFT laws so as to recommend possible remedies. The study reached a set of conclusions, including that it is hoped that policymakers and concerned persons will use the recommendations contained in the research paper to enhance the reduction of money laundering and terrorist financing activities in Nigeria.

According to Thommandru and Chakka (2023), who examine issues of compliance with anti-money laundering policies in the banking sector and the impact of using modern technologies such as block chain, examining issues related to KYC manipulation and the financial burden on banks while addressing AML policies, the paper presents ideas and suggestions, including that the emergence of modern technologies such as block chain has affected AML and CFT. It also includes the ability of block chain technology to bring banking systems closer to compliance policies. Furthermore, Karim, Hermsen, Chala, De Perthuis, and Mandal (2023) used semi-supervised and supervised graph learning techniques on graphs of financial and banking transactions in order to identify suspected potential money laundering operations. The study reached experimental results, including that the study approach can lead to the detection of money laundering operations through real and composite charts of financial and banking transactions. Based on the above discussion, no direct study has examined the relationship between banking supervision and anti-money laundering. Moreover, based on the above discussion, the current study has adopted the following hypothesis:

H: banking supervision has positive and significant effect on anti-money laundering.

3. METHODOLOGY AND RESEARCH DESIGN

This study employed a survey design for the study sample and a quantitative technique to assess the study's hypotheses. The respondents, who work for the Central Bank of Sudan's General Administration of Banking Supervision and the compliance departments of Sudanese banks, provided the data.

3.1. Measure

Variable measurements were used by referring to previous studies. using a five-point Likert scale. Measures to combat money laundering have been adapted through AML controls in Sudan, which include: money laundering and terrorist financing risks-due Diligence procedures towards customers-other controls for establishing business relationships (such as prohibiting numbered accounts, anonymous accounts, or dealing with prohibited persons), cases requiring special procedures (influential persons, correspondent banking relationships, electronic transfers, and new technologies), keeping records and documents, reporting suspicious transactions, and internal control systems.

3.2. Procedures For Data Gathering And Sampling Design

247 bank inspectors and staff members were sampled using the official Central Bank of Sudan website and the websites of commercial banks. The questionnaire was initially written in Arabic since the respondents are of Arab heritage, and because the study was conducted in English, it was translated into English at Brislin's suggestion (1970, 1986). A straightforward random sampling procedure was employed to choose sample respondents from the study's target population so that the findings could be generalized. Namely, 247 questionnaires—representing a response rate of 55%—were returned from a random sample of 500 questionnaires that were sent. These were utilized for the data processing stage after the incomplete questionnaires were discarded.

4. DATA ANALYSIS AND FINDINGS

4.1. Frequencies and Descriptive Statistics

Table 1 presents the results of a survey that was conducted with 247 participants, who were categorized into 7 panels based on their demographic information, including gender, age, experience, qualification, major, job level, and professional qualification. In Panel A, the majority of the participants were male (85%), with a small percentage being female (15%). Panel B shows that the largest age group of the participants was 36-45 years old (44.9%), followed by those from 46-60 years old (18.2%) and 25-35 years old (32.4%). The smallest age group was less than 25 years old (2%).

In Panel C, the largest experience group was from 5-10 years (25.9%), followed by those from 11-15 years (27.9%), and from 16-20 years (15.8%). The smallest experience group was less than 5 years (13%). Panel D demonstrates that the largest qualification group was Master and its equivalent (31.2%), followed by Bachelor (41.7%) and PhD (19.8%). In Panel E, the largest major group was Accounting (42.9%), followed by Other (18.2%) and Banking Sciences (17.8%). Panel F reveals that the largest job level group was department manager (17.0%), followed by other (34.4%) and accountant (21.9%). Finally, in Panel G, the largest professional qualification group was Other (62.8%), followed by Sudanese Fellowship (8.1%) and British Fellowship (7.7%). The results in Table 1 provide an overview of the demographic information of the participants and the distribution of their characteristics in the different panels.

Table 2 presents the descriptive statistics of two variables, bank supervision and money laundering, in terms of their seven indicators, each represented by its mean and standard deviation. For bank supervision, the mean of the seven indicators ranged from 3.82 to 4.13, with a weighted mean of 3.98 and a weighted standard deviation of 1.27. For money laundering, the mean of the seven indicators ranged from 4.01 to 4.17, with a weighted mean of 4.08 and a weighted standard deviation of 1.17. These results suggest that the participants rated both bank supervision and

money laundering as positive, as the means of the indicators are greater than 3 and the standard deviations are relatively low, indicating a high level of agreement among the participants.

Table 1. Frequencies and percentage.

Panel: A		
Gender	**Frequency**	**Percent**
Female	37	15
Male	210	85
Total	247	100
Panel: B		
Age	Frequency	Percent
Above 60 years old	6	2.4
From 25 – 35 years old	80	32.4
From 36 – 45 years old	111	44.9
From 46 – 60 years old	45	18.2
Less than 25 years old	5	2.0
Total	247	100.0
Panel: C		
Experience	Frequency	Percent
Above 20 years	43	17.4
From 11-15 years	69	27.9
From 16-20 years	39	15.8
From 5-10 years	64	25.9
Less than 5 years	32	13.0
Total	247	100.0
Panel: D		
Qualification	Frequency	Percent
Bachelor	103	41.7
High school and its equivalent	1	.4
Higher diploma	3	1.2
Master and its equivalent	77	31.2
Other	2	.8
PhD	49	19.8
Postgraduate diploma	12	4.9
Total	247	100.0
Panel: E		
Major	Frequency	Percent
Accounting	106	42.9
Banking sciences	44	17.8
Business administration	21	8.5
Information technology	31	12.6
Other	45	18.2
Total	247	100.0
Panel: F		
Job level	Frequency	Percent
General manager/ or above	3	1.2
Accountant	54	21.9
Accounting manager	19	7.7
Auditor	26	10.5
Bank inspector	15	6.1
Compliance manager / Deputy	3	1.2
Department manager	42	17.0
Other	85	34.4
Total	247	100.0
Panel: G		
Professional qualification	Frequency	Percent
American fellowship	22	8.9
Arab fellowship	15	6.1
British fellowship	19	7.7
Professional qualification (CAMS)	6	2.4
Nothing	10	4.0
Other	155	62.8
Sudanese fellowship	20	8.1
Total	247	100.0

Table 2. Descriptive statistics of the variable's indicators.

Bank supervision		
Indicators	Mean	Std. deviation
BakSup1	4.07	1.273
BakSup2	4.13	1.133
BakSup3	3.95	1.355
BakSup4	3.82	1.420
BakSup5	3.92	1.230
BakSup6	3.95	1.239
BakSup7	4.01	1.206
	Weighted mean	3.98
	Weighted std. deviation	1.27
Money laundering		
Indicators	Mean	Std. deviation
AnMeyLg1	4.01	1.248
AnMeyLg2	4.10	1.134
AnMeyLg3	4.04	1.329
AnMeyLg4	4.08	1.185
AnMeyLg5	4.09	1.125
AnMeyLg6	4.17	1.026
AnMeyLg7	4.10	1.165
	Weighted mean	4.08
	Weighted std. deviation	1.17

4.2. Assessing Reflective Measurement Models

The evaluation of the measurement model is used to figure out how good the study's constructs are. The evaluation of the quality criteria starts with a look at the factor loadings. Next, construct reliability and construct validity are determined in Figure 1.

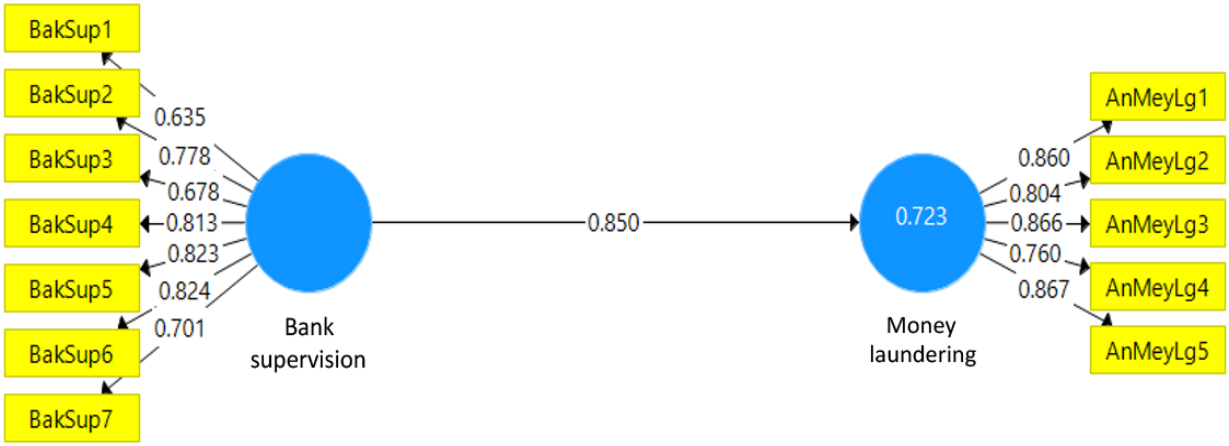

Figure 1. Structural equation modeling (INITIAL).

4.3. Reliability Indicator and Internal Consistency Reliability

The results of the reliability analysis provided in Table 3 suggest that the research instrument used to assess attitudes and beliefs regarding money laundering and bank supervision is a reliable measure of these constructs. The factor loadings for the individual items show that each item is a good indicator of the underlying construct it is intended to measure, with high factor loadings and statistically significant p-values. The internal consistency reliability, as measured by Cronbach's Alpha, is also high for both the money laundering and bank supervision constructs, indicating a high level of consistency between the individual items in measuring these constructs. The composite reliability values provide further support for the reliability of the instrument, with both the money laundering and bank supervision constructs showing high composite reliability values.

According to commonly accepted threshold values for factor loadings, items with loadings below 0.6 may not be contributing much to the measurement of the underlying construct and can therefore be considered for elimination (Hair, Black, Babin, Anderson, & Tatham, 2010). Dropping indicators with low factor loadings can improve the construct validity of the measurement instrument and increase the reliability of the factor solution (Tabachnick & Fidell, 2007).

In this case, there are two indicators (BakSup6 and BakSup6) with factor loadings below 0.6; it may be appropriate to consider dropping these indicators from the analysis. By implementing this approach, it is possible to enhance the total efficacy of the measuring instrument and guarantee that the remaining indications are delivering a more precise and dependable evaluation of the fundamental construct.

According to commonly accepted threshold values for reliability, a Cronbach's Alpha value of at least 0.7 is considered to indicate adequate internal consistency reliability (Hair, Ringle, & Sarstedt, 2012). The results of this analysis show that both the money laundering and bank supervision constructs have Cronbach's Alpha values well above this threshold, with values of 0.888 and 0.871, respectively. Similarly, composite reliability values of 0.9 or higher are considered to indicate a reliable measure of the construct (Raykov & Marcoulides, 2011). Both the money laundering and bank supervision constructs show composite reliability values above this threshold, with values of 0.918 and 0.901, respectively.

In conclusion, these results provide strong evidence for the reliability of the research instrument used to assess attitudes and beliefs regarding money laundering and bank supervision. This tool seems to be a valid and accurate way to measure these concepts, as shown by the high factor loadings, statistically significant p-values, high internal consistency reliability, and high composite reliability values.

Table 3. Reliability indicator and internal consistency reliability.

Items	Construct	Outer loading	P values	Cronbach's alpha	Composite reliability
AnMeyLg1	Money laundering	0.860	0.000	0.888	0.918
AnMeyLg2		0.804	0.000		
AnMeyLg3		0.866	0.000		
AnMeyLg4		0.760	0.000		
AnMeyLg5		0.867	0.000		
BakSup1	Bank supervision	0.635	0.000	0.871	0.901
BakSup2		0.778	0.000		
BakSup3		0.678	0.000		
BakSup4		0.813	0.000		
BakSup5		0.823	0.000		
BakSup6		0.824	0.000		
BakSup7		0.701	0.000		

4.4. Discriminant Validity

This test is thought to be the second type of construct validity. Discriminate validity was usually used to measure how much research variables were related by calculating all of the possible correlations between research variables (Henseler, Ringle, & Sarstedt, 2015).

Table 4 shows the Average Variance Extracted (AVE) of the two variables: bank supervision and money laundering. AVE is a commonly used measure of the reliability of a construct, and it represents the amount of variance in a given construct that is accounted for by the indicators used to measure it. According to common threshold values, an AVE of 0.5 or higher is considered acceptable for a single construct (Hair et al., 2010), indicating that the indicators are measuring the construct in a reliable manner.

Table 3. Average variance extracted.

Variable	(AVE)
Bank supervision	0.568
Money laundering	0.693

The results shown in Table 5 provide insight into the discriminant validity of the constructs under examination. Cross-loadings can help determine if an item from one construct is more strongly associated with another construct than its own parent construct (Wasko & Faraj, 2005). In this study, the results indicate that all items have factor loadings that are relatively similar, suggesting the presence of discriminant validity. As demonstrated by the cross-loading results, items related to the "Money Laundering" construct have high factor loadings with their own construct, with values ranging from 0.760 to 0.867. Similarly, items related to the "Bank Supervision" construct have high factor loadings with their own construct, with values ranging from 0.542 to 0.824. These findings are consistent with the notion that the constructs are distinct and do not measure the same underlying construct (Wasko & Faraj, 2005).

Table 4. Cross loading.

Items	Money laundering	Bank supervision
AnMeyLg1	0.860	0.740
AnMeyLg2	0.804	0.665
AnMeyLg3	0.866	0.728
AnMeyLg4	0.760	0.663
AnMeyLg5	0.867	0.736
BakSup1	0.542	0.635
BakSup2	0.682	0.778
BakSup3	0.524	0.678
BakSup4	0.697	0.813
BakSup5	0.667	0.823
BakSup6	0.682	0.824
BakSup7	0.659	0.701

In conclusion, when the AVE values are high and cross-loadings are above the threshold value of 0.5, discriminant validity can be established. These findings provide strong evidence that the latent variables in a study are measuring different concepts, which is essential for the validity and reliability of the results.

4.5. Structural Model Assessment

The assessment of the structural quality of the research model is a crucial step in ensuring the validity of the findings. Partial Least Squares Structural Equation Modeling (PLS-SEM) has certain differences compared to Covariance-Based Structural Equation Modeling (CB-SEM). Unlike CB-SEM, PLS-SEM does not have a commonly accepted goodness-of-fit statistic (Henseler & Sarstedt, 2013). To rate the structural model, one must look at how well it can predict the endogenous constructs by looking at path coefficients, the coefficients of determination (R2), and cross validated redundancy (Q2) (Henseler & Sarstedt, 2013). R2 measures the accuracy of the prediction of each endogenous construct and the proportion of variance explained (Sarstedt, Ringle, Smith, Reams, & Hair Jr, 2014). A higher R2 value indicates better accuracy of prediction (Hair, Ringle, & Sarstedt, 2011). For business management research, the R2 values for the endogenous latent variables in structural models should be at least 0.75, 0.50, or 0.25. In PLSSEM, the goal is to identify the variation in the endogenous latent variables, so it is important to have a high R2 value for important target constructs. In Figure 1, the R2 value of the endogenous latent variable "Money Laundering" is 0.723. This indicates that bank supervision, as an exogenous variable, can explain 72.3% of the total variation in money laundering.

4.6. Blindfolding Test (Q2)

(Q2) is a measure of the model's predictive relevance, indicating how well the model can forecast the indicators of each endogenous latent construct (Hair et al., 2011). The blindfolding technique is used to measure this value (Wong, 2013). The Q2 value can be measured using cross-validated redundancy and cross-validated communality techniques (Sarstedt et al., 2014). Sarstedt et al. (2014) preferred the first technique. If the Q2 values for an endogenous latent variable are greater than zero, it means that the path model has a reasonable level of prediction accuracy for that construct (Sarstedt et al., 2014). Based on Table 6, it can be seen that the Q2 value for the endogenous latent variable "Money Laundering" is 0.494, which means that the model has a prediction accuracy of 49.4% for this construct. This indicates that the path model has a reasonable level of prediction accuracy for the construct "Money Laundering".

Table 5. Cross-validated redundancy (Q2).

Variable	SSO	SSE	Q^2 (=1-SSE/SSO)
Bank supervision	1729	1729	
Money laundering	1235	624.512	0.494

4.7. Model Fit Test

In partial least squares structural equation modelling (PLS-SEM), the measurement models' reliability and validity are tested first (Hair, Ringle, & Sarstedt, 2013). However, there is no global goodness-of-fit index available in PLS-SEM, so bootstrapping and blindfolding are used to overcome this limitation (Hair et al., 2013). In most cases, the goodness of fit index is not reported. Nevertheless, some researchers suggest looking at the Standardized Root Mean Square Residual (SRMR) and Normed Fit Index (NFI) to evaluate the model's fit. These indices compare the actual correlation matrix based on real observations with the one predicted by the model, ensuring that the model is not misspecified. A good fit is indicated when the SRMR value is less than 0.08 and the NFI value is as close to 1 as possible (Hair et al., 2013). The study model in this case has an SRMR of 0.066, which is less than 0.08, indicating a good fit, as mentioned in Figure 2.

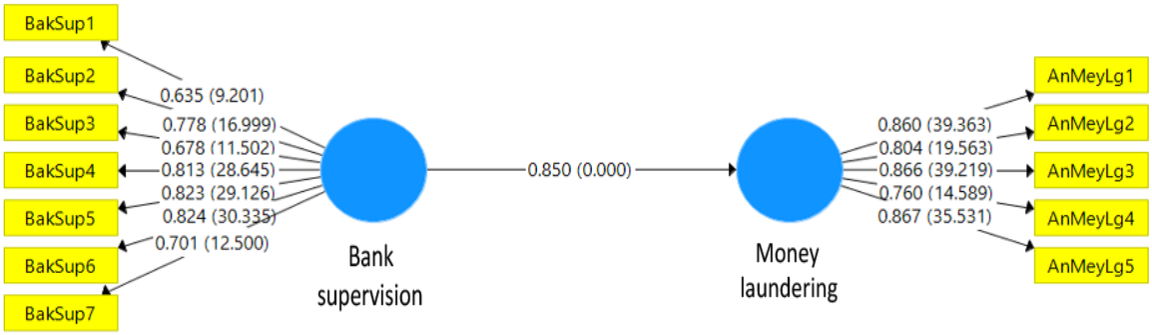

Figure 2. Path coefficient.

4.8. Hypotheses Testing Result

The hypothesis "Bank Supervision -> Money Laundering" is supported based on the results of the regression analysis. The beta coefficient (β) of 0.850 indicates a strong positive relationship between bank supervision and money laundering. The standard deviation (STDEV) of 0.022 suggests that the variability in money laundering is low, while the T statistics of 38.683 and the P values of 0.000 indicate that the relationship between bank supervision and money laundering is statistically significant.

Additionally, in the Table 7 the R2 value of 0.723 indicates that 72.3% of the variation in money laundering can be explained by bank supervision, suggesting a good fit of the model. The 2.5% and 97.5% values represent the 95%

confidence intervals for the beta coefficient and provide an estimate of the range of plausible values for the beta coefficient.

Table 6. Hypotheses testing.

Hypothesis	β	STDEV	T statistics	P values	2.50%	97.50%	
Bank supervision -> Money laundering	0.850	0.022	38.683	0.000	0.807	0.892	Supported
R^2 value	0.723						

5. DISCUSSION, CONCLUSION, IMPLICATION OF STUDY AND IMPLICATION OF STUDY

Examining the impact of banking supervision on anti-money laundering was the major goal of this study. The PLS-SEM was used to analyze the created model after the data was gathered from Sudanese banks. According to the statistical results, the hypothesis was determined to be supported. At the 0.001 level of significance, banking supervision, as hypothesized in H1, has a favorable and substantial impact on anti-money laundering (0.850, t 38.683, p 0.000). This result was consistent with earlier research.

There are several contributions from this study and other studies that may be taken into account. One of these contributions that did not receive the proper scholarly attention was the study of the impact of banking supervision on anti-money laundering. This work may serve as a call for more investigation into this impact, which has been supported. However, only a small amount of conceptual and descriptive research has focused on the function of banking supervision with regard to anti-money laundering. One of the few empirical studies to specifically address Sudan banks and anti-money laundering in general is this one.

This study offers many valuable contributions and insightful information, yet there are still certain areas that need more study. Future research should focus on other factors that can strengthen and clarify the link between banking supervision and anti-money laundering as moderators and mediators, because this study focused on the direct association. Other scholars could decide to carry out comparable studies in some other developing nations and look at the parallels and differences. Last but not least, future research may choose to corroborate the results of this study by using a longitudinal research strategy to identify dynamic changes in the associations between variables over time.

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