

OPEN ACCESS



African Journal of Business Management

February 2023
ISSN: 1993-8233
DOI: 10.5897/AJBM
www.academicjournals.org

 **ACADEMIC
JOURNALS**
expand your knowledge

About AJBM

The African Journal of Business Management (AJBM) is published twice monthly (one volume per year) by Academic Journals.

African Journal of Business Management (AJBM) is an open access journal that publishes research analysis and inquiry into issues of importance to the business community. Articles in AJBM examine emerging trends and concerns in the areas of general management, business law, public responsibility and ethics, marketing theory and applications, business finance and investment, general business research, business and economics education, production/operations management, organizational behaviour and theory, strategic management policy, social issues and public policy, management organization, statistics and econometrics, personnel and industrial relations, technology and innovation, case studies, and management information systems. The goal of AJBM is to broaden the knowledge of business professionals and academicians by promoting free access and providing valuable insight to business-related information, research and ideas. AJBM is a weekly publication and all articles are peer-reviewed.

Contact Us

Editorial Office: ajbm@academicjournals.org

Help Desk: helpdesk@academicjournals.org

Website: <http://www.academicjournals.org/journal/AJBM>

Submit manuscript online <http://ms.academicjournals.me/>

Editor-in-Chief

Prof. Wilfred Isioma Ukpere

*Department of Industrial Psychology and People Management,
Faculty of Management,
University of Johannesburg,
South Africa.*

Editors

Dr. Amran Awang

*Faculty of Business Management,
02600 Arau, Perlis, Malaysia*

Prof. Giurca Vasilescu Laura

*University of Craiova, Romania
13, A.I. Cuza, 200585, Craiova, Dolj,
Romania.*

Associate Editors

Dr. Ilse Botha

*University of Johannesburg
APK Campus PO Box 524 Aucklandpark 2006
South Africa.*

Dr. Howard Qi

*Michigan Technological University
1400 Townsend Dr., Houghton, MI 49931,
U.S.A.*

Dr. Aktham AlMaghaireh

*United Arab Emirates University
Department of Economics & Finance
United Arab Emirates.*

Dr. Haretsebe Manwa

*University of Botswana
Faculty of Business
University of Botswana
P.O. Box UB 70478
Gaborone Botswana.*

Dr. Reza Gharoie Ahangar

*Islamic Azad University of Babol,
Iran.*

Dr. Sérgio Dominique Ferreira

*Polytechnic Institute of Cavado and Ave
Campus IPCA, Lugar does Aldão, 4750-810. Vila
Frescainha,
Portugal.*

Prof. Ravinder Rena

*Department of Economics
University of the Western Cape
Private Bag: X17
Modderdam Road
Bellville 7535
Cape town, South Africa*

Dr. Shun-Chung Lee

*Taiwan Institute of Economic Research
No. 16-8, Dehuei Street, Jhongshan District,
Taipei City 104,
Taiwan.*

Dr. Kuo-Chung Chu

*National Taipei University of Nursing and Health
Sciences No. 365, Min-Te Road, Taipei,
Taiwan.*

Dr. Gregory J. Davids

*University of the Western Cape
Private Bag x17, Bellville 7535,
South Africa.*

Prof. Victor Dragotă

*Bucharest Academy of Economic Studies, Department
of Finance
Bucharest, Sector 1, Piata Romana no. 6, Room 1104,
Romania*

Dr. Maurice Oscar Dassah

*School of Management, IT and Governance
University of KwaZulu-Natal
Post Office Box X54001
Durban
4000
South Africa.*

Prof. Joseph Offiong Udoayang
University of Calabar
P.M.B 1115, Calabar. Cross River State, Nigeria.

Prof. Robert Taylor
University of KwaZulu-Natal
Varsity Drive, Westville
South Africa.

Dr. Nazim Taskin
Massey University - Albany
Quad Building A, Room 3.07
Gate 1, Dairy Flat Highway (State Highway 17)Albany,
New Zealand

Prof. João J. M. Ferreira
University of Beira Interior (UBI)
Estrada do Sineiro, Pólo IV 6200 Covilhã,
Portugal.

Dr. Izah Mohd Tahir
Universiti Sultan Zainal Abidin
Gong Badak Campus, 21300 Kuala Terengganu,
Terengganu, Malaysia.

Dr. V. Mahalakshmi
Panimalar Engineering College
7-A,CID Quarters, Mandaveli,Chennai-600028,
Tamilnadu,
India.

Dr. Ata Allah Taleizadeh
Iran University of Science and Technology
Faculty of Industrial Engineering,
Iran University of Science and Technology,
Narmak, Tehran, Iran.

Dr. P.S. Vohra
Chandigarh Group of Colleges, Landran, Mohali, India
#3075, Sector 40 D
Chandigarh, Pin code 160036

Dr. José M. Merigó
University of Barcelona
Department of Business Administration, Av. Diagonal
690, Spain.

Prof. Mornay Roberts-Lombard
Department of Marketing Management,
C-Ring 607, Kingsway campus, University of
Johannesburg, Auckland Park, Johannesburg, 2006,
South Africa

Dr. Anton Sorin Gabriel
Carol I Boulevard, No. 11, 700506, Iasi,
Alexandru Ioan Cuza University Iasi,
Romania.

Dr. Aura Emanuela Domil
31 Horia Creanga, zip code 300253, Timisoara,
West University from Timisoara,
Faculty of Economics and Business Administration, Romania.

Dr. Guowei Hua
NO. 3 Shangyuancun, Haidian District, Beijing 100044,
School of Economics and Management,
Beijing Jiaotong University, China.

Dr. Mehdi Toloo
Technical University of Ostrava,
Ostrava, Czech Republic

Dr. Surendar Singh
Department of Management Studies, Invertis University
Invertis village, Bareilly -
Lucknow Highway, N.H.-24, Bareilly
(U.P.) 243 123 India.

Dr. Nebojsa Pavlovic
High school "Djura Jaksic"
Trska bb, 34210 Raca, Serbia.

Dr. Colin J. Butler
University of Greenwich
Business School, University of Greenwich, Greenwich, SE10
9LS,
London, UK.

Prof. Dev Tewari
School of Economics and Finance
Westville Campus University of Kwa-Zulu
Natal (UKZN) Durban, 4001
South Africa.

Dr. Paloma Bernal Turnes
Universidad Rey Juan Carlos
Dpto. Economía de la Empresa
Pº de los Artilleros s/n
Edif. Departamental, Desp. 2101
28032 Madrid, España

Dr. Jurandir Peinado
Universidade Positivo
Rua Silveira Peixoto, 306
Zip 80240-120 Curitiba – PR – Brazil

Table of Content

Lending appraisal and performance of SACCOS in district, Uganda Agaba Moses, Turyasingura John Bosco and Kabagambe Jesse	23-31
Adoption of blockchain technology in the banking sector of Ghana: Opportunities and challenges Kofi Nyarko Gyimah ^{1*} , Emmanuel Asiedu ² and Frank Antwi ¹ ,	32-42

Full Length Research Paper

Lending appraisal and performance of SACCOS in district, Uganda

Agaba Moses, Turyasingura John Bosco and Kabagambe Jesse

Faculty of Economics and Management Science, Department of Management Science, Kabale University, Kabale, Uganda.

Received 5 November, 2022; Accepted 9 February, 2023

This study's objective was to assess how lending appraisal affected SACCO performance in the District. The study's outcome variables were the performance of SACCOS, with SACCO governance serving as a predictor variable. The investigation was preceded by a cross-sectional survey. Data from 5 SACCOS with 109 respondents were collected, and both quantitative and qualitative analyses were merged. The analysis was conducted at three levels, namely: Descriptive, bivariate and multivariate analyses. Since descriptive analysis entailed description of a single variable and its attributes, frequency tables were used to present the data. At the bivariate level, a Pearson correlation matrix was conducted to ascertain the relationships between the predictor variables and the dependent variable. The dependent variable was regressed against using the updated predictor variables for loan approval at the multivariate level (performance of SACCOS). A linear regression model was used to fit the data. According to study findings from the regression model, loan appraisal (coef. = -0. 635, p-value=0.000) have a positive influence on the performance of SACCO in District. This study's main finding is that corporate governance has a big impact on SACCOS performance. The study consequently advises that more emphasis should be given to implementing corporate governance in order to ensure good performance of SACCOS in Rukiga District.

Key words: Lending appraisal, performance, SACCO

INTRODUCTION

Appraisal refers to assessing the applicant's credit worthiness, which may also be a sign of their capacity to keep their promises (Odhiambo, 2019) and increase performance of SACCOS. A credit assessment is a thorough evaluation of a specific loan application or proposal to determine the borrower's capacity for repayment. A lender will perform a credit appraisal primarily to ensure that the bank will be reimbursed for the funds it lends to its clients (Aduda and Obondy,

2021). According to Alio (2021), three thousand years ago, in Ancient Greece and Rome, the lending system was invented. One of the first lending practices was adopted by the pawnbrokers. Pawnbrokers lend by requiring collateral from the borrower in order to reduce risk for the lender. The exchange of products initially used this strategy. Lending appraisal processes through measuring, cash flow analysis, collateral measure, character assessment, capital considerations, and

*Corresponding author. E-mail: agabamosez@yahoo.com.

Author(s) agree that this article remain permanently open access under the terms of the [Creative Commons Attribution License 4.0 International License](https://creativecommons.org/licenses/by/4.0/)

conditions fulfillment globally have not been taken into consideration in an effort to improve performance, which has affected SACCO performance in terms of realizing profitability, portfolio size, growing SACCO membership, and asset base Orichom and Omeke (2021). The effectiveness of SACCOs is being questioned, which is why the majority of them are closing at a high rate and they are not growing, but governments throughout the world are interested in using them as a tool to fight poverty. In the past, lending appraisal in Africa began with microfinance and progressed through many stages. The sector was invented in the 1970s, notably in West and East Africa, by financial intermediaries such cooperatives, rural savings banks, and postal savings banks Bosco (2019). By the end of the 1990s, the sector had seen a number of donor-supported non-governmental organizations (NGOs) that only provided credit grow and occasionally change into new categories of non-bank financial institutions Agaba and Turyasingura (2022). Credit cooperatives are currently the majority in West Africa, regulated non-bank financial institutions are the majority in East Africa, and Southern Africa is served by a sizable number of NGOs, some downsizing banks, and newly established special-purpose MSME banks (Zipporah, 2019). The majority of MFIs that are reported are regulated, however the majority of uncontrolled MFIs are found in East Africa. The shifting regulatory environment that has existed since 2004 and allowed MFIs to become regulated deposit taking institutions continues to be advantageous for MFIs in Uganda. As a mortgage information and analytics supplier, Loan Performance provides risk management and financial analysis for the SACCO's operations (Cheror, 2020). A performing loan is any loan in which interest and principal payments are fewer than 90 days past due, less than 90 days' worth of interest has been refinanced, capitalized, or deferred by arrangement, and continuous payment is anticipated, according to the International Monetary Fund. Orichom and Omeke (2021) explain that loan performance is based on the notion that a loan contract's income results from an interest rate premium over a rate at which the funds could have instead been invested. As a result, it is a rough indicator of the surplus the bank could expect if there are no issues throughout the span of the credit contract. The effectiveness of a loan is also determined by the frequency of disruptions, such as borrower delays in making principal and/or interest payments, borrower technical defaults, or even insolvency. According to Gichuhi and Omagwa (2020), such disturbances imply either a categorical loss of payments for the bank, increased costs owing to renegotiations, active engagement in the borrower's company policy, usage of collateral, or possibly all of these elements. Therefore, loan performance declines as the frequency of such interruptions increases. From 2017 to 2018, Kihanga SACCO's loan portfolio had a performance of 75%; from 2018 to 2019, it had a

performance of 45%; from 2019 to 2020, it had a performance of 30%; from 2020 to 2021, it had a performance of 25%; and in 2021–2022, it had a performance of 20%. Bukinda SACCO's loan portfolio has performed satisfactorily from 2017 to 2018 with a 69% success rate, 57% success rate from 2018 to 2019, 46% success rate from 2019 to 2020, 30% success rate from 2020 to 2021, and 25% success rate from 2021 to 2022. The performance of the loan portfolio at Kamwezi SACCO from 2017 to 2018 was 78%, the performance from 2018 to 2019 was 70%, the performance from 2019 to 2020 was 62%, the performance from 2020 to 2021 was 45%, and the performance from 2021 to 2022 was 20%. Lyamujungu SACCO's loan portfolio has performed 74% satisfactorily from 2017 to 2018, 50% satisfactorily from 2018 to 2019, 46% satisfactorily from 2019 to 2020, 35% satisfactorily from 2020 to 2021, and 18% satisfactorily from 2021 to 2022. Rukiga SACCO's loan portfolio has performed 81% satisfactorily from 2017 to 2018, 62% satisfactorily from 2018 to 2019, 30% satisfactorily from 2019 to 2020, 21% satisfactorily from 2020 to 2021, and 15% satisfactorily from 2021 to 2022. This was the driving force behind the researcher's inquiries into the reasons behind and approaches to identifying timely solutions.

LITERATURE REVIEW

In a study by Jepkorir (2022) on the impact of lending appraisal on SACCO performance in Kenya, it was found that when a client is being considered for a loan facility, their records in the SACCO should be transparent and show cash flow analysis, collateral considerations, character evaluation, and conditions fulfillment. The study used a case study approach and came to the conclusion that lending appraisal should make a clear assessment of the clients' records in the institution for efficient loan disbursement. The choice should be based on how the SACCO's performance ought to be. Given the loan sizes and terms, the loan appraisal should include the clients' ability to repay the loan. Joshua et al. (2021) conducted a study of the Influence of Credit Risk on Financial Performance of Deposit Taking Microfinance Banks in Kenya. The findings revealed that, the study examined 9 banks over a 7-year period (2011 to 2017). The association between credit risk and performance of deposit-taking microfinance banks in Kenya was captured using secondary data. Descriptive statistics, correlation analysis, and panel regression analysis were used to analyze the data. Eview version 8 statistical software was used to calculate the association between the study variables. Using Durbin-Watson factors, the autocorrelation within the regression model was examined. The null hypothesis was tested for acceptance or rejection using the augmented Dickey Fuller (ADF) unit root test (non-stationarity) (stationarity). According to the

regression results, credit risk had a favorable and statistically significant impact on the financial performance of Kenya's deposit-taking microfinance institutions. In addition to analyzing the impact of credit risk on other financial institutions like SACCOs and commercial banks, the study suggests that additional research be done to determine the impact of credit on the financial performance of deposit-taking microfinance banks using more credit variables and longer time periods. Additionally, as they are not covered by the study, research on additional risks, such as market, interest-rate, liquidity, strategic, compliance, and legal risks, needs to be done. However, the study was silent on the 5Cs which guide lending appraisal on performance of SACCOs.

According to (Karanja and Simiyu, 2022) loan assessment is the "heart" of a stellar portfolio (2022). A study on the credit management practices and loan performance of microfinance banks in Kenya was undertaken by Karanja and Simiyu. This study's objective was to determine the impact of credit management techniques on loan performance at Kenyan microfinance firms. This effort focuses on 13 microfinance institutions in Kenya. An approach to descriptive research was used in the study. Additionally, the study indicated that client evaluations were successful. According to the report, the company investigates a client's creditworthiness before approving a loan. The study discovered that the bank employs credit analysts, whose job it is to evaluate every possible loan applicant. There are many service providers that the bank has hired, such as credit tracking companies to help track vehicles used as collateral, insurance companies, law firms that help with security in cases where land has been used as collateral, CRB companies that help by providing information on clients' CRB performance, and company search firms, such as credit info, that help. According to the survey, the rate of loan defaults is under 20%. The study also discovered that calling clients regularly to remind them of their loan obligations, especially the persistent defaulters, can enhance loan performance. According to the analysis, microfinance banks in Kenya had significant advance displays of credit policy, client evaluation, collection policy, credit terms, and credit hazard control, all of which were rated at 5% importance and 95% certainty. The review's findings reveal that their organizations conduct customer evaluation. The study also revealed the value of client evaluations. According to the study, the company investigates a customer's credit quality before approving a loan.

A study on the credit management practices and financial performance of savings and credit cooperatives (SACCOS) in Mid-Western Uganda was also carried out by Kule et al. (2020). The study's goal was to determine the connection between SACCOs in Mid-Western Uganda's credit management systems and their financial performance. A closed-ended questionnaire was employed in the investigation. The typical linear

regression analysis was run. Findings: A modest, significant, and favourable association between credit management systems and the financial performance of SACCOs in Mid-Western Uganda is revealed by the study's findings. One-of-a-kind contribution to practice and policy: This report advises management that in order for SACCOs to improve their financial performance by ensuring that attractive terms and conditions and an adequate client appraisal procedure are in place, effective credit management systems must be put in place. Government could also assist SACCOs by training personnel in the creation of credit terms and conditions and enhancing their client evaluation skills. To back up what has been said A study on the impact of client evaluation and loan monitoring strategies on the repayment of revolving funds in Kenya was carried out by Kinyua et al., 2022. The study's goal was to determine how client evaluation and loan monitoring procedures affected Kenya's revolving fund repayment. The study, which was completed in the 18-month period from January 2020 to June 2021, focused on Kenyan government revolving funds that were disbursed from 2010 to 2019. The WEF officers in the 47 counties and the Youth officers in the constituency were the target demographics. Purposive sampling and a correlational research strategy were used in the study. Data was gathered by questionnaires, and SPSS version 23 was used for analysis. The results of the study showed that business assessment visits (coefficient 5.473, P-000), training frequency before disbursement (coefficient 2.715, P-0.002), and the type of training provided before disbursement (coefficient 5.473, P-000) all had positive and significant effects on the repayment performance of revolving funds (coefficient 7.548, P000). On the other hand, it was shown that the frequency of monitoring visits had a favorable and significant impact on Kenya's revolving fund repayment performance (coefficient 2.327, P-0.023). Additionally, the amount of arrears report had a favorable and significant impact on Kenya's revolving fund payback performance (coefficient 2.842, P-0.02). The study found that loan monitoring tactics significantly improved the repayment performance of revolving funds in Kenya, while there was a strong positive correlation between customer appraisal strategies and repayment performance of revolving funds in Kenya. The five c's, however, which are crucial for improving SACCO performance, were not covered.

In general, the loan should be secured by collateral, and the board of directors should document and approve the route of approval. The success of SACCOs is indeed impacted by loan lending policies. The majority of SACCOs have efficient and effective loan lending practices. According to a study by Oji and Odi (2021), management can assess how well it will be able to generate profits from the SACCO's entire pool of assets through loan appraisal. If this assessment is not done well, it could have negative effects on asset returns and the financial performance of SACCOs in the USA. There

was no need for SACCOs to improve their client loan evaluation policy in order to have a favorable impact on financial performance, according to the study's recommendations, which were based on a complete loan appraisal of the loan application before loan advancing. Salaton et al. (2020) further noted that credit evaluation provides SACCOs with knowledge about the rate of interest to charge the clients that may not push them too far into a corner by taking into account the clients' financial strength, credit score history, and payment patterns (Wambua et al., 2021) The processes and techniques used in credit evaluation have an impact on the efficiency of the credit appraisal system. In SACCOs, credit appraisal procedures range from straightforward objective methods to unofficial ways to highly intricate strategies including the use of simulation. Before increasing the loan facility, Wanyonyi et al. (2019) examined the efficiency of loan appraisal in determining the borrower's behavior and character. She also looked at how it affected the financial performance of SACCOs in Nigeria. According to Wilberforce et al. (2021), the degree to which financial transactions are conducted with trust, confidence, and the least amount of risk determines how effective SACCOs are in fostering growth and financial performance.

MATERIALS AND METHODS

Research design

This study used across sectional survey research design adopting quantitative and qualitative approaches. Quantitative approach helps to describe the current conditions and to investigate cause and effect relationships between the study variables, Mulinge (2019) while qualitative approach helps to gain insight, explore the depth, richness and complexity inherent in the phenomenon under investigation. The quantitative approach is sought to quantify and establish the relationships while the qualitative approach helped the researcher gain in-depth explanations on loan appraisal on performance of SACCOs in District.

Area scope

July 2017, Rukiga District was wrapped into District from Kabale District. It only has one county, four sub counties, two town councils, thirty parishes, and two hundred and ninety-three villages. Southern Uganda is where the district is situated. The Ntungamo District to the east, Kabale District to the southwest, Rubanda District to the northwest, and Rukungiri District to the north is the districts that border the District. The district offices are situated 11 km from the Mbarara-Kabale Highway. According to the Local Government Quarterly Performance Report (2018/2019), district has 56 registered SACCOs that are overseen and managed. This study took into account 5 SACCOs namely Rikiga SACCO, Kihanga-Mparo SACCO, Bukinda SACCO, Lyamujungu SACCO and Kamwezi United SACCO.

Data sources

Employees and members of the Rikiga SACCO, Kihanga-Mparo

SACCO, and Kamwezi United SACCO provided the data for this study. Interviews and questionnaires were the main data sources for this project.

Study population

150 people from 4 SACCOs in Rukiga District make up the study's total population. Due to their high-performance levels in the District, four (4) SACCOs were chosen. But despite being the hub of Rukiga District, the rate at which the SACCO is deteriorating is worrying. The target population for the study consisted of the 15 employees of the SACCOs, with a fraction of 5 given to each SACCO. A list (sample frame) of these staff members and members from each SACCO was compiled. There were 135 members altogether among the 5 SACCOs, with 45 members apiece. There were three managers in all for the three SACCOs, one for each of the SACCOs. 150 people made up the study's population.

Sample size determination

The researcher chose a total of 150 participants for the study and calculated the sample size using the formula provided in Tora Yamane (1970:886–87), as shown below.

$$n = \frac{N}{1 + Ne^2}$$

where e is the precision level (or margin of error) and N is the total population. Using a 95% confidence interval or an error of 0.05 and a sample size of n of 150 participants overall;

$$n = \frac{150}{1 + 150(0.05)^2} \cong 109$$

Therefore, out of the total population of 150, 109 respondents were sampled.

Sampling techniques

The population of the study was divided into subgroups using stratified random sampling, as indicated in Table 1 column 2. "Stakeholders' obligations" functioned as the subpopulation (N_i) for the stratifying variable. Following that, sub samples (n_i) were chosen using the probability proportional to size method; $n_i = \frac{n}{N} \cdot N_i$ Where N=150, n=109 and Ni=141;3 and 6.

Data collection methods and techniques

A systematic questionnaire was administered by the researcher in order to gather data from primary sources. This allowed the enumerators to clarify any issues that the respondents had questions about or that they felt were unclear. SACCO managers, SACCO staff, and SACCO members all received the questionnaire. The questionnaire was administered by the researcher, two research assistants, and enumerators. The enumerators had a full day of training in performing fundamental research, notably in practice surveys, and were then prepared to handle the data gathering work.

Quality control (validity and reliability)

Validity

To ensure validity, the research instrument covered all the

Table 1. Categories of respondents.

Respondent	Target population (N _i)	Proportionately selected sample (n _i)	Sampling technique
Members of SACCO	139	103	Simple random sampling
SACCO Managers	5	2	Simple random sampling
SACCO Employees	6	4	Purposive sampling
TOTAL	150	109	

Source: Field Data, 2022.

Table 2. Showing content validity index ranges.

CVI Range	Interpretation
0.9-1	Excellent
0.8-0.89	Good
0.70-0.79	Acceptable
0.60-0.69	Questionable
0.50-0.59	Poor
0.00-.0.5	Unacceptable

Source: Field Data, 2022

dimensions of the phenomenon under study as clarified in the conceptual framework. (Orichom and Omeke, 2021) Prior to the study, the researcher visited District administration to seek for permission to conduct a study from the district and to ascertain that the study was necessary. This helped the researcher to make arrangements to ensure that all the necessary data was collected freely and timely.

The questionnaire's format, contents, clarity, consistency, and relevance in relation to the research objectives were discussed with coworkers and the supervisor. The content validity index (CVI), a measure of an instrument's level of accuracy, was computed to determine the instruments' level of accuracy (Table 2). It was calculated using Amin's CVI formula from 2005: CVI = Number of items declared valid / total Number of items. The researcher calculated the CVI to assess the instrument's level of accuracy, and then used George and Mallery's (2003 rule of thumb to interpret the CVI:

$$CVI = \frac{\text{Number of relevant items}}{\text{Total number of items in an instrument}}$$

$$CVI = \frac{37}{42} = 0.88$$

A questionnaire had a good content validity index of 0.88, indicating that the instrument was reliable for gathering data

Reliability

Reliability evaluations look at how consistently the measuring tools give results when the same populations of people are repeatedly measured under the same circumstances (Wilberforce et al., 2021; Turyasingura et al. (2022). A pilot study with respondents who were purposefully and simply chosen at random from the target area is also used to test the validity of the research tools. Five SACCOS in

the District served as the pilot recipients of questionnaires. They were asked to review the questionnaire for the following qualities: question design, language, clarity, and thoroughness. Cronbach's Alpha coefficient was used to further prove the instruments' dependability. The results are 0.76 on a Statistic Package for Social Scientists (SPSS) scale, which shows that the tools are more accurate and useful. Therefore, it is inferred that there is a high level of trust in the dependability of the entire scale if individual items are significantly connected with one another. In terms of the Cronbach's alpha, George and Mallery (2003) offer the following guidelines: " > 0.9 - Excellent, > 0.8 - Good, > 0.7 - Acceptable, > 0.6 - Questionable, > 0.5 - Poor, and < 0.5 - Unacceptable" (Table 3).

Data management and analysis

Data management and processing

Three stages of data analysis, descriptive, bivariate, and multivariate were carried out. Frequencies, tables, and other output were produced as part of the descriptive analysis. In a bivariate study, the Pearson rank correlation was used to determine the linkages between categorical variables and, in addition, to compute the connections between the dependent variable and the independent variables. Again, cross tabulations were utilized to show relationships between the variables.

Multivariate analysis

Only independent variables that at the bivariate stage showed a significant connection with the dependent variable were incorporated into the linear regression model at this point in the fitting process. In other words, at the multivariate level, only variables that were significant in the bivariate stage were regressed. The equation below represents the multivariate model;

Table 3. Reliability information.

Variable	Cronbach's alpha	Number of items
Cash flow analysis	0.956	16
Collateral measure	0.971	16
Character assessment	0.872	16
Performance of SACCO	0.932	20
Total	3.731	
Average	3.731/4=0.9333	

Source: Field Data 2022.

$$SP = \beta_0 + \beta_1 IC + \beta_2 SG + \beta_3 LA + \varepsilon$$

Where SP = SACCO performance; IC = Cash flow analysis; SG = Collateral measure; LA = Character assessment; ε = Error term; β_1 , β_2 , and β_3 are the partial coefficients which explain how each of the independent variables (Cash flow analysis, Collateral measure and Character assessment) impact on the performance SACCOs.

The success of SACCOs was predicted to be positively impacted by proper cash flow analyses, collateral measures, and character assessments.

Ethical considerations

The study was conducted solely for academic purposes; thus, the researcher asked the district SACCO administration for approval. Before distributing the questionnaire, she also asked the respondents for their consent

RESULTS AND DISCUSSION

Descriptive statistics for lending appraisal on performance of SACCOs in Rukiga District

This section presents the descriptive statistics based on the views of respondents regarding lending techniques of SACCOs in district (Table 4).

SACCOs use a borrower's collateral value as a criterion for loan approval

When asked if our SACCO uses a borrower's collateral value as a criterion for approving loans, 72% of respondents said yes, compared to 14% who were undecided at the time of data collection with the mean response of 3.7339, and the standard deviation of 1.20679. This implies that on average 3.73 of the respondents said yes. This suggests that the loans SACCOs provide to customers are determined by the loan officers' recommendations (Moma, 2019). Agaba and Turyasingura (2022) concurred, stating that loan performance serves as a provider of mortgage information and analytics, providing risk management and financial analysis for the SACCO's activities. And this is supported by Muriithi (2019).

Before a loan may be disbursed, the applicant must satisfy all requirements to obtain it

The results showed that before a loan can be disbursed, the applicant must satisfy all requirements for accessing one. 10.1% of respondents were undecided, compared to 66.9% of respondents who strongly agreed with the statement with mean of 4.3028 with standard deviation of 40157. This implies that, 4.303 of the respondents said yes. This shows that the majority of the respondents who have been dealing with these SACCOs in District have found the lending methods to be effective. People who weren't sure may have firmly joined the SACCOs. Mongare and Nyakwara (2019) concur that a loan application must be supported by collateral before it can be approved. This suggests that the credit appraisal or loan appraisal process should be a comprehensive activity that begins when a potential borrower enters the bank and ends with credit delivery and monitoring.

In their SACCO, the client's capacity and cash flow are taken into account while evaluating loans

The results showed that in their SACCO, the client's capacity and cash flow are taken into account while evaluating loans. This demonstrated that 100% of respondents strongly agreed with the statement, which was supported by all respondents with mean of 4.3486 with standard deviation of 47874. This implies 4.48 of the respondents said yes. This suggests that the loans department pays close attention to the guidelines and practices that governed borrowing. The success of SACCOs can be attributed to this. According to Zipporah (2019), the client's loan application should be in place with the client cash flow within the company as the basis for an effective credit risk management procedure and this is supported by Muiruri et al, (2021)

When evaluating a client's credit worthiness, capital is a critical prerequisite

The results showed that capital is a crucial requirement when evaluating a client's credit worthiness with 100%

Table 4. Lending appraisal technique of SACCOs.

Statement	SA		D		UD		SD		D		Mean	Standard deviation
	F	%	F	%	F	%	F	%	F	%		
The collateral value of a borrower is a criterion used by our SACCO to approve loans	79	72	16	14.7	14	12.8	00	00	00	00	3.7339	1.20679
The applicant must fulfill all requirements before a loan can be disbursed	73	66.9	25	22.9	11	10.2	00	00	00	00	4.3028	40157
In our SACCO, the capability and cash flow of a client are taken into account when evaluating loans	100	91.7	00	00	9	8.3	00	00	00	00	4.3486	47874
Capital is a crucial requirement when determining a client's credit worthiness	109	100	00	00	00	00	00	00	00	00	3.5321	1.40481
Our SACCO bases a loan applicant's eligibility on their character worth	96	88.1	00	00	13	11.9	00	00	00	00	4.3486	47874
Our SACCO uses a borrower's collateral value as a criterion for loan approval	109	100	00	00	00	00	00	00	00	00	3.8991	47130

SA+A=Agree; UD=Undecided; SD+D= Disagreed.
 Source: Primary data 2022.

with mean of 3.5321 with standard deviation of 1.40481. This implies that, 3.5.3 of the respondents said yes. The assertion was firmly agreed with by each and every respondent. This shows that the SACCOs in the district are doing well overall. Customers whoborrow money from SACCOs can afford to pay it back. This is in keeping with Salaton et al. (2020) assertion that credit provision needs careful consideration because credit risk management is one of the key components and a pressing issue among the problems that banks face. The two posts assert that risk management is essential for both sustainability and the expansion of the banking industry. It also helps stabilize the local currency and the economy as a whole.

SACCO bases a loan applicant's eligibility on their character value

The results demonstrate that SACCO bases a loan applicant's eligibility on their character value. This was demonstrated by the fact that 88.1% of respondents strongly agreed with the statement, compared to 11.9% who were unsure with mean of 4.3486 and standard deviation of 47874. This is an indication that, 4.348 of the respondents said

yes. This suggests that the client must have been saving well and have a good character in order to acquire a loan facility.

The worth of the collateral determines a loan applicant's eligibility according to SACCO

The results demonstrate that SACCO bases a loan applicant's eligibility on the value of their collateral. This is shown by the fact that, during data collecting, 100% of respondents strongly agreed with the statement with the mean of 3.8991 and standard deviation of 47103. It means that, 3.899 of the respondents said yes. This suggests that, as far as SACCO performance is concerned, leadership tactics strategies in the SACCOs functioning in the Kabarole district have been successful for the institutions. This concurs with Agaba and Turyasingura (2022), who believe that poorly managed credit risk can result in liquidity risk, which leads to the insolvency of financial institutions. They also believe that the presence of risk in the financial sector is linked to the products they offer. Therefore, if loan quality slightly declines, the business is likely to fail, and credit risk management presents a workable alternative.

Bivariate analysis

Correlation analysis

The correlations between the performance of SACCOs and the predictor variables (cash flow analysis, collateral measure, and character assessment) are shown in this section. The correlation matrix shows how the predictor variables and the dependent variable are related (Table 5).

Relationship between loan and performance of SACCO

Table 4 findings demonstrate that loan appraisal showed a substantial positive relationship ($r=0.656^{**}$; p -value 0.01) with the performance of SMEs. These results suggest that loan evaluation enhances SACCO performance. According to Agaba and Turyasingura (2022), as a mortgage information and analytics supplier, Loan Performance provides risk management and financial analysis for the SACCO's operations. A performing loan is any loan that contains interest and principal payments that are fewer than 90 days past due, that has had less than 90 days'

Table 5. Correlations between the independent variables and the dependent variable (Financial performance of SACCOs).

		Loan appraisal	Performance of SACCOs
Loan appraisal	Pearson Correlation	1	0.656**
	Sig. (2-tailed)		0.000
	N	109	109
Performance of SACCOs	Pearson Correlation	0.656**	1
	Sig. (2-tailed)	0.000	
	N	109	109

Source: Field data 2022.

Table 6. Model summary.

Model	R	R square	Adjusted R square	Std. error of the estimate
1	0.898 ^a	0.737	0.653	0.32395

a. Predictors: (Constant), Loan appraisal; b. Dependent Variable: Performance of SACCOs.

Table 7. Linear regression results estimating the effects of the independent variables on performance of SACCO'S.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Loan appraisal	0.543	0.058	0.635	9.326	0.000

a. Dependent Variable: Performance of SACCOs
Source: Field Data, 2022.

worth of interest refinanced, capitalized, or agreed-upon interest deferred, and that is expected to continue to be paid.

Multiple regression analysis

This section uses a linear regression model to describe the multivariate results for loan appraisal on SACCO performance. The performance of the SACCO was the dependent variable, and this model was chosen since it converted it into a continuous variable. According to Table 6 the independent variable loan appraisal (adjusted R-squared = 0.653) explains 73.7 percent of the variation in the performance of SACCOs. This suggests that even if SACCOs adhere to internal controls, SACCO governance, and loan evaluation procedures, they will only see a 62.7% improvement in performance. This indicates that in addition to loan evaluation, other financial management techniques also have an impact on SACCO success. Results indicate a substantial positive correlation between loan appraisal and SACCO performance (coef = -0.653, p-value = 0.000). Keeping other predictor factors fixed, an increase in loan appraisal is correlated with a 0.635 increase in SACCO performance (Table 7). The alternative hypothesis is

preferred above the null hypothesis, which states that loan appraisal has no discernible impact on the performance of SACCOs.

Conclusion

The findings and discussion lead to the supposition that loan appraisal and SACCO performance in the district are significantly positively correlated. There was sufficient evidence to disprove the null hypothesis that loan appraisal had no impact on SACCO performance. These results demonstrate unequivocally that most SACCOs carry out cash flow analysis, collateral measure, character assessment, capital considerations, and condition fulfillment.

Recommendations

In order to make sure that the people requesting for loan facilities in the area can repay the money they have borrowed, the study advises management to first carefully assess the applicants' or customers' character, capacity, condition, and collateral. The profit will increase as a result, payments to employees will always be made on time, and performance information will be available.

CONFLICT OF INTERESTS

The authors declare they have no competing interests with study design or final report, no financial or personal relationships with other people or organizations that could inappropriately influence this research.

REFERENCES

- Aduda J, Obondy S (2021). Credit risk management and efficiency of savings and credit cooperative societies: A review of literature. *Journal of Applied Finance and Banking* 11(1):99-120.
- Agaba M, Turyasingura JB (2022). An assessment of the accounting techniques on business performance in selected commercial banks in Kabale Municipality, Uganda. *International Journal of Academic Accounting, Finance and Management Research* 6(9):28-37.
- Alio D (2021). Determinants of credit utilization among Savings and Credit Cooperatives (SACCOS) members in Soroti district, Uganda (Doctoral dissertation, Makerere University).
- Bosco NJ (2019). Loan Management And Performance Of Microfinance Institutions In Rwanda: A Case Musanze District (2015-2017).
- Cheror WN (2020). Impacts of credit management practices on financial stability of savings and credit cooperative societies.
- Gichuhi AW, Omagwa J (2020). Credit management and loan portfolio performance of savings and credit cooperative societies in Nyandarua County, Kenya. *International Academic Journal of Economics and Finance* 3(5):121-139.
- George D, Mallery P (2003). *SPSS for Windows step by step: A simple guide and reference*. 11.0 update (4th ed.). Boston, MA: Allyn & Bacon.
- Jepkorir S (2022). Determinants of Financial Distress in Deposit-Taking Savings and Credit Cooperative Organizations in Kenya. Doctoral dissertation, JKUAT-COHRED.
- Joshua A, Olweny T, Oloko M (2021). Influence of credit risk on financial performance of deposit taking Microfinance Banks in Kenya. Available at: <https://pdfs.semanticscholar.org/1f7e/0b84356e5f02c3c8b16d26921707eb9405af.pdf>
- Karanja SG, Simiyu EM (2022). Credit Management Practices and Loan Performance of Microfinance Banks in Kenya. *Journal of Finance and Accounting* 6 (1):108-139.
- Kinyua JW, Kiiru G, Njoroge D (2022). Effect of Client Appraisal and Loan Monitoring Strategies on the Repayment of Revolving Funds in Kenya.
- Kule BJMK, Kamukama N, Kijjambu NF (2020). Credit management systems and financial performance of savings and credit cooperatives (SACCOS) in mid-western Uganda. Available at: <http://ir.must.ac.ug/handle/123456789/1207>
- Moma J (2019). Effects of credit policy on financial performance of savings and credit cooperative societies at premier credit organization in Kampala Uganda (Doctoral dissertation, Kampala International University, College of Economics and Management).
- Mongare OJ, Nyakwara S (2019). Analysis of Performance Appraisal Implementation on Organization Performance in Saccos: Case of Kisii County, Kenya. Available at: <https://pdfs.semanticscholar.org/77e4/f43c76baef242652f58feedc841f26e9d3ad.pdf>
- Muiruri ZW, Ndegwa J, Gweyi M (2021). Moral Hazard Related Determinants of Bad Debts in Deposit Taking Saccos in Nairobi County. *Journal of Finance and Accounting* 5(1):1-15.
- Mulinge EK (2019). Effect of Credit Risk Management Framework On Financial Performance of Deposit Taking Savings And Credit Cooperatives In Kenya.
- Muriithi MN (2019). Factors Contributing To Loan Defaulting Among Savings And Credit Societies In Kirinyaga County, Kenya (Doctoral dissertation).
- Odhiambo SPO (2019). Determinants of financial performance of savings and credit cooperative societies in Nakuru town, Kenya. *Reviewed Journal International of Business Management* 1(1):42-53.
- Oji GU, Odi ER (2021). Risk management and return on equity: An estimated model of micro-credit institutions from Nigeria.
- Orichom G, Omeke M (2021). Capital structure, credit risk management and financial performance of microfinance institutions in Uganda. *Journal of Economics and International Finance* 13(1):24-31.
- Salaton KE, Gudda P, Rukaria G (2020). Effect of Loan Default Rate on Financial Performance of Savings and Credit Cooperative Societies Innarok, County Kenya. Available at: <http://41.89.101.166:8080/handle/123456789/10570>
- Turyasingura JB, Moses A, Meza O, Zombeire J, Kyabarongo B (2022). Resourcing and the sustainability of Donor funded Potatoes Projects in Kabale District, Southwestern Uganda. Available at: <http://196.43.162.58/handle/20.500.12493/704>
- Wambua VM, Waweru KM, Kihoro JM (2021). Influence of Capital Adequacy on the Loan Performance of Deposit Taking SACCOS in Kenya. *African Journal of Co-operative Development and Technology* 6(1):1-10.
- Wanyonyi DJ, Kamau CG, Sasaka PS (2019). Effect of loanable funds and director's skills on financial performance of non deposit taking SACCOS in Mombasa County. Available at: <https://ir.tum.ac.ke/handle/123456789/17344>
- Wilberforce B, Robert M, Atwiine DW (2021). The Effects of Credit Terms on Loan Performance of SACCOS in Mbarara City.
- Zipporah WM (2019). Determinants of The Level of Bad Debts in Deposit Taking Savings and Credit Cooperative Societies; Nairobi County. Doctoral Dissertation.

Full Length Research Paper

Adoption of blockchain technology in the banking sector of Ghana: Opportunities and challenges

Kofi Nyarko Gyimah^{1*}, Emmanuel Asiedu² and Frank Antwi^{1,3}

¹Accounting and Finance Department, Pentecost University, Accra, Ghana.

²Department of Finance, University of Nuertingen, Geislingen, Germany.

³School of Finance and Economics, Jiangsu University, Zhenjiang, China.

Received 17 November, 2022; Accepted 16 February, 2023

The evolution of blockchain technology has drastically altered the provision of banking services. Businesses are currently transitioning to a paperless environment. Robots are taking over labor-intensive jobs, Artificial Intelligence (AI) is assisting in tracking any massive disaster, and biotech is assisting in curing multiple illnesses in a matter of seconds. Blockchain, one of the most important inventions of our time, is poised to assist individuals in reaching new heights of innovation in almost all domains. However, like other technologies, blockchain is confronting unique hurdles that must be overcome before widespread adoption particularly in Ghana and in Africa as a whole. This paper sought to examine the opportunities and challenges of the adoption of blockchain technology in Ghana. A qualitative technique in data gathering was employed for the purpose of this paper. The study used an interview-based technique, aimed to identify and communicate the problems that the banking sector in Ghana experiences in adopting blockchain technology. The interview took place in Ghana's capital, Accra. One representative from the Ghanaian Central Bank and nine from Commercial banks were interviewed. The paper concludes that the implementation of blockchain technology in Ghana's banking sector is being hampered by a lack of international norms or laws, high energy costs, a lack of intermediaries, poverty, corruption, a lack of infrastructure, and a lack of technical support.

Key words: Adoption, banking sector, blockchain technology, financial industry, opportunities, challenges.

INTRODUCTION

Commercial banking operations have been subjected to significant technological and financial innovation for more than 25 years. In terms of financial products, services, and production technology, there has been a significant shift. Many banks are now integrated as part of global financial institutions that engage in a variety of financial operations because of technological innovation (Frame et al, 2014; Anagnostopoulos, 2018; Cucari et al., 2021).

Due to technology that did not exist previously, modern business methods and more efficient company strategies have emerged. Nobody expected the internet to make Spotify, Teams, Skype, and Airbnb possible. At this time, blockchain technology is the technology to keep an eye on. The anonymous Satoshi Nakamoto invented blockchain technology (Nakamoto, 2008). Technological improvements, according to Ji and Tia (2021), are giving

*Corresponding author. E-mail: kngyimah@pentvars.edu.gh. Tel: 00233-245071936.

rise to new issues and opportunities for various organizations. Corporations' failure to adapt to this shift may result in their extinction from the industry. The banking industry is one of the industries that would benefit greatly from Blockchain technology. Blockchain is well known as the technology that underpins the virtual Cryptocurrency Bitcoin, but this article looks into its other applications. What is Blockchain? Blockchain has been defined by Kaur et al. (2018) as "a distributed database or public ledger of all transactions or digital events performed and shared among participating parties". Zheng et al. (2019), posit that using Blockchain to execute commercial operations is less expensive and faster as it acts as a software distribution mechanism that allows transactions to be completed without the use of a trusted middleman, such as a bank. Blockchain adoption allows all transactions to be inspected and tracked. Blockchain technology was created to track bitcoin transactions, and as a result, it may be used in a variety of industries, including banking, stock exchange, insurance, electoral systems, rental agreements, and state service (Dai and Vasarhelyi, 2017). Bitcoin is the world's first distributed digital currency. Bitcoin, a digital currency, and Blockchain, a related technology, have risen to prominence (Chen, 2018). Blockchain and its use have a bright future because they introduce a new type of financing and provide a significant buffer for investing in modern technology (Mavilia and Pisani, 2019). They believe that Blockchain will be a useful instrument for promoting and improving social development in the Global South, particularly in Ghana. Guo and Liang (2016), state that Blockchain technology will improve and revolutionize the financial sector since it can reform the basic technology of settlement and credit structure. Numerous studies on the impact and issues preventing the adoption of Blockchain in the banking sector have been conducted in various parts of the world, but none in Ghana. However, the use of advanced technology in Ghana's banking sector has been limited, and as a result, there has been little or no research on the subject. Furthermore, this research could be particularly useful in determining the precise application of Blockchain technology in the financial sector. The goal of the study is to determine the possible causes for the slow acceptance of Blockchain technology in the banking sector, as well as to contribute to the current debate about the perceived opportunities and challenges to Blockchain adoption in the banking sector. It seeks to fill the knowledge gap.

LITERATURE REVIEW

Numerous kinds of literature have been suggested to clarify what instigates Blockchain technology in financial institutions. The researcher reviewed the literature on Blockchain in the banking sector in other parts of the

world and various business sectors. This is done to draw a conclusion to the research and learn and build from it.

Blockchain in other regions

This work examines the benefit of Blockchain technology in the banking sector, with a case in India, Italy, South Korea, and China. Garg et al. (2020) selected experts who were closely linked with Blockchain-related initiatives in the banking sector across India. These experts were interviewed. They concluded that the benefits of Blockchain technology to the banking systems are the reduction of outgoing cost, transparency, exclusion of intermediaries, and efficient financial transactions. Cucari et al. (2021) write about the impact of Blockchain on banking processes in a case study of the Italian banking sector. Their research follows an abductive theory-building method. They conducted exploratory research and concluded that Blockchain technology can influence and enhance the back-office process. It also shows the system that permits Blockchain technology to enhance the productivity of Banks by Interbank reconciliation. Yoo (2017) researched Blockchain in the banking sector of South Korea. The researcher found that Blockchain technology is majorly used in financial institutions, mainly in payment, Global transfers, stocks, and Smart contracts. With the use of Blockchain technology, there has been an increase in transfers between financial institutions such as Banks without the help of a Reserve Bank. However, Yoo (2017) pointed out that customer needs and technological advancements are changing rapidly, making it very needful for Banks to incorporate Blockchain technology. Liu and Lin (2021) published a paper on the application of Blockchain in China's banking sector. They found out that the utilization of blockchain technology in Banks can assist transform remittance systems, enhance credit risk control, enhance the organization of efficiency of the central and operations office, and improve smart business.

Blockchain in developing countries

Kshetri and Voas (2018) argued that developing countries such as Ghana, Nigeria, South Africa, and Egypt would be affected positively by Blockchain: it can help decrease fraud and extortion and increase legal possession titles, bringing about the Global South's entrepreneurial drive. It can also help financial deals occur more swiftly and ensure that help is distributed with a smaller chance of theft and hoax. Papadaki and Karamitso (2021) examined the application of Blockchain in the MENA. They found out that various standards are implemented in different countries in the MENA region because Blockchain is in its embryonic stages of development. They also found out that there is less

education and government support in providing research funds to most countries in MENA. Making accessible research capital and suitable education is principal for improving the experienced workforce and permitting better innovation in the MENA region. Mavilia and Pisani (2019) examined the application of Blockchain and catching up in developing countries. They gathered their data from surveys, interviews and central banks from 53 African countries. They found that the application of Blockchain technology can cause and implement modern types of finance and provide massive opportunities for investment. They also found out that Blockchain technology is still at an embryonic stage in the Global South, specifically Africa, and could be a purposeful instrument for pursuing and executing social development. In addition, Mavilia and Pisani (2019) opine that National governments should consider the advantages they would get from adopting Blockchain and equally come up with laws to make Blockchain work. Senou et al. (2019) published a paper on Blockchain for child labour decrease in cocoa production in West Africa and central Africa. They surveyed existing works connected to child labour and Blockchain. They proposed a smart contract model for their study. They found out that children's condition can be enhanced on the cocoa farm, leading to social welfare. Blockchain is useful because of its transparency and dependability. A smart contract is practiced by decreasing child labour by authorizing farmers to farm upon fulfilling certain circumstances indicated in the smart contract protocol (Senou et al., 2019). Kumar et al. (2019) surveyed in the form of a questionnaire to ascertain the problems faced by industries in adopting Blockchain technology in the global south. The survey was done in Karachi, Pakistan. They used a convenience sampling method to gather their data from various citizens of Karachi. They concluded that the industries in developing countries are not hesitant and have set the least priority on Blockchain technology. They also believe that there is a lack of skilful resources in developing countries (Kumar et al., 2019). Bharti (2019) conducted exploratory research, and the data was gathered from different data sources such as journals and research papers. They took a perspective of India and concluded that the challenges impeding Blockchain adoption are lack of IT infrastructure, lack of regulatory framework, lack of interoperability and Privacy, and Data protection.

Application of blockchain in Ghana

Blockchain is being used for the Cocoa beans supply chain, the Tilapia supply chain, and Land registration in Ghana. One may ask, what is the impact of Blockchain in these sectors? This part of the literature tries to demystify the impact of Blockchain in these areas so that the researcher can draw ideas to help in this research.

Musah et al. (2019) conducted a descriptive-explorative study and concluded that Blockchain has undoubtedly impacted the cocoa supply chain and has helped reduce the problems associated with the supply chain. Rejeb (2018) believes that Blockchain technology can transform Tilapia's supply chain, thereby removing the supply chain challenges. Agbesi and Tahiru (2020), state that Blockchain technology is being used for land registration in Ghana. It has helped resolve the problems of land ownership in Ghana. Now, there is sincerity, immutability, and clarity in the land administration in Ghana. In addition, Mintah et al. (2020) explored the possibility of Blockchain usage in land purchase and title registration. They conducted a systematic literature review attached to casual discussions with major observers in Ghana. They found out that information on all land deals could be accessible to the public in actual time. They believe this will intensify transparency and potentially settle the issue of infringements and vague land boundaries because investors can specify the rightful landowners before starting deals. Deka et al. (2018) explored the application of Blockchain technology in fund management in Ghana. They gathered data from selected employees of fund management through unstructured interviews. They found out that financiers will have confidence in data protection and effortlessness in doing deals on the web without a third party via Blockchain technology.

Blockchain in the banking sector

This paper reviews the literature on the application of Blockchain technology in the banking sector. Rajnak and Puschmann (2020) researched using a systematic sampling approach with knowledgeable participants from Switzerland. SurveyMonkey was used to gather the data for supporting the research framework. They selected 104 banks using the hypothesis model to analyze their data. Their research aimed to find out the impact of Blockchain on business models in banking. They found that Blockchain technology influences all aspects of banks' business models, although Blockchain technology is still in a primitive phase of advancement. Ji and Tia, (2021) researched to ascertain the effect of Blockchain in the banking sector. They conducted a survey by collecting data from different Banks in Nanjing City, China. They used the PLS to analyze the data. They found out that fraud reduction, the Privacy of Blockchain, security, transparency, and decentralization positively impact all aspects of a Bank's business intelligence. On the contrary, Peter and Moser (2017) did a survey by sending questionnaires to Banks, stock exchanges, credit card providers, Fintech firms, and consulting firms. These firms are located in Austria, Germany, and Switzerland. They found out that the answers given by the Banks are fully extended. None of the banks intend to apply

Blockchain technology because of a lack of legal framework, interoperability, lack of standards and governance, and lack of electronic identity management. Garg et al. (2020) selected experts who were closely linked with Blockchain-related initiatives in the banking sector across India. These experts were interviewed. They concluded that the benefits of Blockchain technology to the banking systems are the reduction of outgoing cost, transparency, exclusion of intermediaries, and efficient financial transactions. Cucari et al. (2021) write on the impact of Blockchain on banking processes in a case study of the Italian banking sector. Their research follows an abductive theory-building method. They conducted exploratory research. They performed a semi-structured interview. Cucari et al. (2021) interviewed research managers of the Italian Banking Association (ABI). They concluded that Blockchain technology can influence and enhance the back-office process. It also shows the system that permits Blockchain technology to enhance the productivity of Banks by Interbank reconciliation. Yoo (2017) researched Blockchain in the banking sector of South Korea. The researcher found that Blockchain technology is majorly used in financial institutions, mainly in payment, Global transfers, stocks, and Smart contracts. With the use of Blockchain technology, there has been an increase in transfers between financial institutions such as Banks without the help of a Reserve Bank. However, Yoo (2017) pointed out that customer needs and technological advancements are changing rapidly, making it very needful for Banks to incorporate Blockchain technology. Liu and Lin (2021) published a paper on the application of Blockchain in China's banking sector. They found out that the utilization of blockchain technology in Banks can assist transform remittance systems, enhance credit risk control, enhance the organization of efficiency of the central and operations office, and improve smart business.

Challenges of implementing blockchain

Patki and Sople (2020) researched the challenges of Blockchain technology to the banking sector with a case on India Banks, Fintech Corporations, and banking consultants. They interviewed 25 executives through a structured questionnaire. They found out that Blockchain has a tremendous capacity to change the banking industry. However, its application is loaded with some challenges, which comprise interoperability- there is no general international standard for the blockchain in the world; security- there is no high-rise security for the Blockchain and legal framework; there is no international law on the administration of the Blockchain. Osmani et al. (2020) reviewed relevant academic literature on the Blockchain. They argued that Banks using Blockchain should be ready to face issues such as scalability, where programmers can get access to private information by

changing data. Banks cannot reverse any transaction done mistakenly. Lastly, blockchain technology applications are green in the financial sector, making them difficult to regulate. A survey of Blockchain conducted by Gao et al. (2018) identified two specific challenges to applying Blockchain technology, namely security challenges, and performance challenges. Under security challenges, they outlined some issues such as attack and selfish mining, anonymity and privacy, and abuse of Blockchain. They also argued that the availability of a blockchain system is also another possible challenge. Fernandez-Vazquez et al (2019) published a paper on Blockchain in Fintech. They carried out a systematic mapping study. They examined a total of 49 papers. Fernandez-Vazquez et al (2019) found out that Blockchain adoption challenges are electronic risks, latency, laws, and regulatory and technology development. In addition, Liu and Lin (2021) emphasize that the challenges of Blockchain technology in Banks include society's negative attitude towards Blockchain technology, technical issues, high human resource cost, and material cost in establishing the technology, lack of legal establishment, and the mode of policy supervision is not clear.

Benefits of blockchain

This segment of the paper looks at the benefit derived from the application of Blockchain in the banking sector, according to Hassani et al. (2018), who conducted a complete review of 100 industry-related articles and just a few academic papers. They found out that Blockchain can enhance KYC mechanism, transactions are done faster with less activity, and safety, Blockchain gives banks a lesser overhead cost, smart contract. Clearness is reinforced because the deals are shared across the system, and the ability to increase the volume of deals a Bank may undertake as the essential possibilities. In addition, Patki and Sople (2020) also contributed to the research on the benefit of Blockchain technology. In their research, they found the Low deal cost, high speed of processing remittances and payment deals, no intermediaries or middlemen involved in the Blockchain, transparency of transactions, and lastly, records are noticeable to the parties involved, but none of them can alter the deal process. Osmani et al. (2020) also argued that Blockchain depends on combined administration to provide trust in the money market to guarantee that all engage by accepted rules. The research carried out by Ali et al. (2020) reviewed academic articles on Blockchain technology in the financial sector. They concluded that users could be able to manage their deals and data. Performing transactions would be guaranteed in every respect without an intermediary. They also argued that Blockchain technology could change the system of financial tools. Through theoretical analysis, Gao (2021) also presents the motive for the application of Blockchain

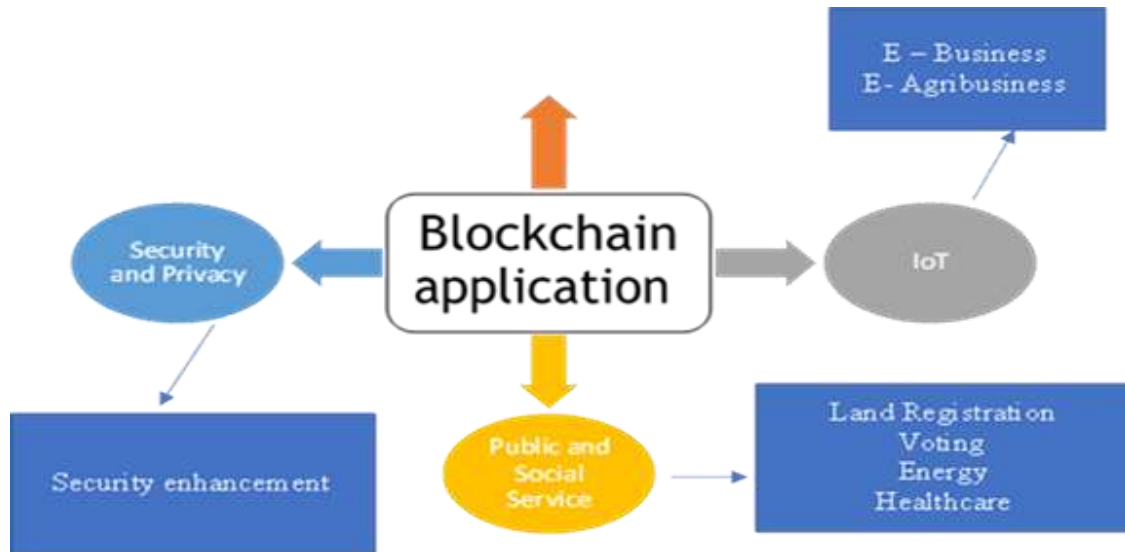


Figure 1. Contextual framework of blockchain application.
Source: Authors' construct based on the application of blockchain in other sectors (2022).

technology extensively involved with and used in the banking sector by using the appropriate systems of business principles. Gao (2021) writes that Blockchain promising technology could change the banking sector. He stated that Banks could create a new system of trust technique with customers under a protected and open network that augments infosec and boost business extent. He also writes that the banking business can save costs and improve efficiency via the Blockchain application and believes that Blockchain could become the primary technology of Banks with additional regulations established. On the other hand, Drescher (2017) believes that the absence of any intermediary may limit its adoption in the banking sector. Vovchenko et al. (2017) conducted an analysis of blockchain adoption in Russia and they emphasized that Blockchain brings a sustainable Unique Selling Point (USP) for Banks in financial contracts derived from cost reduction, transparency, and effective management over operational risk. Farah (2018) researched the opportunities embedded in the application of Blockchain in the financial sector. He argued that Blockchain technology has brought about "The Internet of Value exchange," Blockchain has changed a Bank's business model, Blockchain has strengthened market efficiency, and all the processes of Blockchain are saved on a distributed network that helps to protect truthfulness. The authors' construct of contextual framework of blockchain application based on the application of blockchain in other sectors is shown in Figure 1.

Potential impact of blockchain in the banking sector

Patki and Sople (2020) write on the application of

Blockchain to the banking sector with a case on India Banks, Fintech Corporations, and Banking consultants. They interviewed 25 executives through a structured questionnaire. They found out that Blockchain application is used in different banking processes such as access to funds, processing of Trade Capital deals, including the processing of Letters of Credit (LCs) and account inspection to minimize non-performing assets, facilitating secured loans and lending at a reduced rate of interest, discharging of trade and assets with stored Know Your Customer (KYC) data on a concurrent basis, enhancing transparency and quick settlement, and lastly, enhancing the SCF process with better process security and effectiveness. In addition, Wu and Liang (2017) explored the application of Blockchain in the banking sector in China. They explained that blockchain technology could be applied in the Banking industry in the following areas, namely intellectual property security, asset cataloguing, and securitizing assets. Guo and Liang (2016) published a paper on the application of Blockchain in the banking sector. They found out that Blockchain technology could remodel the payment clearing and credit report process in Banks, improving and metamorphosing them. They believe that Blockchain technology is seen as disruptive technology; it comes with its challenges, such as regulation, efficiency and security issues.

Blockchain in the African region

Niyitunga (2022) posit that correct and well-controlled medical records play a key role in high-quality health care. They are a significant asset that permits hospitals to take care of patients in an efficient way. However, in Ghana, medical records are not given much academic

attention. Good record-keeping has been hampered by poor management, as well as a lack of trained personnel who understand how to record and keep these records. Niyitunga (2022) conducted research to explore the application of blockchain technology in enhancing medical records at African hospitals specifically in Ghana and South Africa. The study was qualitative, comprising desktop research of secondary material and its analysis. Niyitunga (2022) found that poor medical reports in sickbays promote the predominance of disease in the Global South such as Africa, which results in resources that could be invested in improvement projects being redirected to health care as an alternative. It also shows that blockchain-based technology could play a major role in the administration of medical records in Africa. Niyitunga (2022) believes it could help organizations acquire and keep more accurate medical records, and ensure their security and longevity. In addition, patients could also gain access to their data, consequently assisting them to assess and control their own health.

METHODOLOGY

This study employed a qualitative technique in data gathering. Commercial banks and the Central bank in Ghana were suitable for this research because access to the pertinent data needed for the research can be sourced from these institutions. The purposive sampling technique was used to select nine commercial banks which consist of a good blend of private and public banks in Ghana. Altogether, 10 sets of one-to-one interview were conducted with about sixty minutes per interview. The participants were experts who have in-depth knowledge of Blockchain technology and Fintech operations. The purposive sampling method was adopted to pledge authentic analysis and ensure that the selected have been operating in Ghana for more than ten years. Semi-structured interviews were used to gather the primary data. Given that the research area is intricate, interviews were considered to be a suitable approach for data collection against having a questionnaire. By gathering data in this form, the researchers were provided with explanations and more excellent data. An interview guide was designed aiming to conduct each interview. The research questions were based on the themes of the literature review. The interview questions were fine-tuned separately for every interviewee consistent with individual factors. After the ten interviews, data plethora was attained with recurring topics and assertions expressed. Therefore, further interviews were unnecessary, with the data providing a good foundation for further analysis.

The data gathered through audio recordings were transcribed with a MAXQDA tool. MAXQDA is a software program for the assessment of qualitative data. MAXQDA is capable to evaluate all the information usually gathered in the context of empirical social research. Obviously, the software can also be used for tasks outside of social science study. MAXQDA can support your work throughout every phase of a project. A key element of MAXQDA and software is the possibility of working with codes and allocating codes to particular sections of your data whether they are words or paragraphs of a text, parts of an image, or happenings in a video. The recordings were listened to repetitiously to ensure accuracy. Record memos were used to characterize information about the interview's circumstances and organizational aspects pertinent to the study. Documentation of this information was essential for communicating the findings and examining the quality and dependability of data mining. The next phase was to work on the

transcripts. Firstly, lessening the text was done by examining the content and lessening the extent of information by eliminating sentences that do not express meaning and are only used to construct discussion. This lessening of empirical data was done by reading through every text a few times and writing keywords and themes utilizing colour coding and eventually identifying common groupings. The lack of uniformity in this kind of interview can cause dissimilar types of information attained depending on the interviewer and the period it was gathered. To improve reliability and increase the uniformity of the semi-structured interviews and improve validity, an interview guideline was designed to guide the conduct of the interview. Additionally, to increase the authenticity, the respondents were constantly given a context to the research and its purposefulness at the commencement of each interview.

Data analysis

The purpose of the research was to ascertain the likely factors impeding the implementation of Blockchain technology in the banking sector while participating in the present debate on the perceived factors impeding the adoption of Blockchain in the banking sector in other world regions. The paper sought to find answers to the following research questions:

RQ 1: What are the concerns associated with implementing Blockchain technology in Ghana?

RQ 2: Is the banking sector of Ghana well equipped to embrace Blockchain technology?

RQ 3: What are the legal issues regarding the adoption of Blockchain technology in Ghana?

The primary data acquired, on the application of blockchain technology and other significant information were analyzed and summarized using MAXQDA Software. This part is divided into two subgroups that result from the TAM 2 model. The TAM 2 model assesses the intermediating function of perceived easiness of use and perceived benefit in their connection between structural characteristics and the likelihood of system application. Cognitive Instrumental Processes that emphasized the expediency, the superiority and the results of blockchain technology applications are observed. The social influence Method unveiled the findings that pertained to social methods and cultural aspects. The quotations in this part have the name of respondent banks and dates when the interview took place to assist the reader know which quotes the interviewee makes. The coding of the subject was then accomplished separately by color-coding the transcripts. Table 1 shows the color codes used.

Technology

Answers connected with technological advantages and challenges were color-coded. These were generally discovered in the middle of the interviews. The interviewees usually expressed their responses in the following ways: advantages are [...]; strength is [...]; weakness is [...]; challenges are [...].

Culture

Answers connected with social factors were color-coded. The answers were mostly discovered in the middle and end of the interviews. The participants commonly involved the following words in their answers: legal issues; less government supports; and culture.

Table 1. Visualization of the data from MAXQDA.

Code system	Frequency (450)	Percentage (100)
Interview main topics		
Technology		
Advantage	24	5.3
Strength	25	5.6
Weakness	12	2.7
Challenges	57	12.7
Culture		
Legal Issues	61	13.6
Less Government support	32	7.1
Culture	35	7.8
Acceptance		
Adoption	29	6.4
Implementation	16	3.6
Solution	32	7.1
Social Impact		
Corruption	34	7.6
No Intermediaries	20	4.4
Trust Issues		
Transparency	35	7.8%
Traceability	24	5.3
Dependability	14	3.1

Source: Author

Acceptance

Answers connected with technology acceptance were color-coded. The answers were mostly discovered toward the end of the interviews. The participants commonly involved the following words in their answers: adoption; implementation and solution.

Trust

Answers connected with decentralized trust were color-coded. The answers were mostly discovered in all parts of the interviews. The participants mostly involved words like: transparency; trust and traceability.

Social Impact

Answers connected with Banking were color-coded. The answers were in parts of the interviews. The participants mostly involved the following words in their answers: corruption; and no intermediaries. Eventually, the coding of the transcript was switched, and another reading of the transcript was done in order to categorize the findings.

RESULTS AND DISCUSSION

In this part, the conclusions from the research were

evaluated jointly with the findings from the literature review. This part is divided into two subgroups which are resulting from the TAM 2 model. The first part, cognitive instrumental process, emphasized how the expediency, the superiority, and the results of blockchain technology are observed. The second part, social influence method, unveiled the findings that pertained to social methods and cultural aspects. The quotations in this part were numbered to assist the reader know which quotes are made by the same interviewees. The numbers are nevertheless not connected to the list of interviewees presented earlier.

Cognitive instrumental process

Three main findings linked to the perceived advantages of blockchain technology are presented in this study. These findings have similarities to the interviews and are supported by the literature review. A similarity in the preponderance of the interviews was that blockchain was perceived to have ferocity of job significance as described in the TAM 2 framework. Additionally, a preponderance of the institutional interviews proposed that blockchain technology is significant and perceived as

valuable in the banking industry. The key features of the technology that were used as inspirations were its ability to decrease costs by reducing the number of arbitrators, computerizing processes by exploiting smart contracts, trackability, building trust, and speedy settlements. Moreover, the implementation of blockchain was perceived to generate substantial outcomes as it could impressively reduce costs by eliminating arbitrators and computerizing processes. Nonetheless, blockchain was only perceived to be beneficial in certain precise circumstances in academic interviews. It was affirmed that if the establishment of trust is the only justification for a blockchain application, it is oftentimes needless. The reason is that blockchain technology will have a minimal comparative advantage over modern technologies as trust can occasionally be generated easier and in more useful ways. This was also affirmed by one of the interviewees about the cost of implementing the technology. New technologies turn out to be very expensive in their implementation. Conversely, sometimes, where trust cannot be generated differently, it can be advantageous to apply blockchain provided its cheaper such as in multilateral environments. In one of the academic interviews, the following was aforementioned about the comparative advantage of blockchain when queried if blockchain is particularly advantageous:

“In a system where it consists of numerous small stakeholders deprived of an ordinary central stakeholder. It may not continually be excellent for all the members, but it is good for the system unfortunately the cost of implementing a blockchain is very expensive” – Interviewee A.

Besides, the technical interview condemned the present-day output level of blockchain as they perceived the Blockchain technology is not mature enough for application. The absence of standard and legislation descriptions and steady protocols were particularly emphasized as challenges to the technology. The following was mentioned about blockchain and its maturity:

“A virgin and versatile technology. The code must be steady, and the procedure should be well-defined. There are no standard descriptions and individuals are still developing the latest concepts in the blockchain which they apply in their own style. Currently, that is how organizations work because you must follow an established procedure” – Interviewee B.

The quote above shows how the absence of standardization or legislation is a feature adversely affecting the perceived serviceability as described in the TAM 2 model. It is also supported by a contemporary study where it was discovered that there is a need for

standardization at the code level (Patki and Sople, 2020). In the energy sector, comparable results from research have also been made about blockchain technology (Song et al., 2018). An additional significant feature that was considered in the academic interview was that although transparency can contribute to certain systems, it can be regarded as a concern in others. Consequently, the output level of blockchain varies dependent on the interests of the members. The key problem that transparency could generate is that certain corporations can be unenthusiastic to distribute their information as it could endanger their position of competitive advantage. The reason is that increased effectiveness is not usually in every stakeholder's interest as effectiveness can also denote that revenue could reduce because you are the ineffective participant. In one of the interviews, the following statement was made about stakeholders' unwillingness to distribute their information: “It is about conquering, not being authentic” – Interviewee A.

This is consistent with the aforementioned study, where it has been discovered that blockchain will not just produce victors but also failures (Novak and De Silva, 2019) and highlights blockchains' capability to modify the movement of money in a fashion that can be problematic to predict. In the interviews, it was discovered that this adversely affected the perceived usefulness of applicants feeling endangered by the technology. The other principal discovery that evolved from the academic interview was that blockchain technology has the possibility to increase banking transactions. This information was inspired by numerous factors. The most typical was its technological features which could accelerate the incorporation of documentation solutions to reduce the obstacles of entry to the system. Additionally, the identification obstacle does not occur for the distributed blockchain cryptocurrencies which are accessible nowadays, the only requisite to partake in these systems for anybody is an internet and a gadget. Nevertheless, it is significant to discover how these kinds of solutions deprived of prerequisites for documentation can be created to conform to fundamental principles such as KYC. In Ghana, most homes do not have access to the internet thereby making it impossible to utilize blockchain technology. This is in agreement with earlier research, where it has been said that it is imperative for blockchain to succeed if individuals who participate in this application have an internet connection (Kumar and et al., 2019).

Moreover, another significant characteristic that was discovered in a greater part of the interviews was the case that blockchain is distributed, permissionless, and computerized, which makes a resilient instance for utilizing this technology to increase banking transactions as the technology does not differentiate, it permits everybody to join because it knows no risk. Likewise, in some of the interviews, it was emphasized that the technology's capability to permit deals at nigh zero charges could make it useable in settlement and when

making small transactions. The significance of these features for increasing blockchain application in the banking sector is supported by discoveries in a study published by the ICRIER (Indian council for research on international economic relations). It was discovered that high-priced, lack of documentation, lack of technological know-how, and lack of trust are significant causes describing why Blockchain technology is not applied in the banking sector (Sharma et al., 2019).

Social influence process

Discoveries connected to perceived usefulness involving social influences procedure are discussed in this study. Moreover, as in the preceding part discoveries are examined consistent with the distribution of innovations theory. Primarily, most interviews proposed that the usage of blockchain solutions is perceived to upsurge individuals' social impression and significance, attributes described in the academic structure of TAM2, by stimulating more effective banking services. This is reinforced by the numerous issues discussed in the interviews. Blockchain applications that can assist to increase banking services and thus their social impression and significance are credit scoring, worldwide settlement, credit history, and enhancing electoral processes such as voting. One key discovery from the interviews concerning blockchain in Ghana is that the technology may be needless and not seen to be advantageous if the unique aim of applying it is to build trust. This is because trust can be created easier and more efficiently through informal ways in our Ghanaian communities, thereby giving blockchain technology a low comparative benefit. Hence, If the only aim of applying blockchain is to build trust, it is very significant to contemplate every individual case aiming to arrive at assumptions on blockchains' comparative benefit. There is less trust in government and corporations in Sub Sahara which can be an issue according to Interviewee A. Some nations in Global South have been plagued with non-transparency and bribery. One typical corruption in Africa is land fraud. This is where individuals form alliances and conspire with government officials to produce land titles they want to obtain. In the last issue, blockchain can be used to create secure computerized land records. The subsequent assertion was made about blockchain technology by a Central bank official in Ghana about how the technology can be exploited to lessen bribery, and thus upsurge banking services but its cost of implementation is very enormous: "Blockchain is distributed, blockchain technology does not differentiate. Everybody can partake because it does not matter if you are rich or poor" – Interviewee C. This comment by interviewee C, emphasizes the significance of the technology's capacity to not be manipulated by unethical third parties, which is a problem in Africa. However,

research has found that the level of corruption can be a barrier to innovation. Bribes weaken the possibility of new technologies being introduced. Additionally, a major part of the interviews recommended that a good end-user experience will be of big significance if blockchain solutions are going to be implemented. Interviewee D said this about the significance of the command-line interface when asked what is important to make people in Ghana perceive Blockchain as advantageous:

"Most Ghanaians that use unofficial saving systems do it in physical cash. You cannot have one or two buttons on an app if you want to create an informal saving system on a blockchain app. You should have very little information. For a technology to be accepted, it is very significant to keep it simple" – Interviewee D

Principles regarding blockchain technology will depend on the personal experience of usage consistent with TAM2. Improved system involvement may decrease the effects of personal norms according to TAM 2 model. To build a progressive peculiar experience, frequent practice, and system involvement of blockchain solutions, the strategy of the end-user experience must be streamlined, easy, and customized to the population in most individuals in the Ghanaian population are underprivileged and illiterate. Generally, what can be concluded is that while the impaired organized circumstance of Ghanaians produces big hypothetical for numerous blockchain use cases, it can likewise be a big impediment to its implementation and distribution.

CONCLUSION AND RECOMMENDATIONS

Concerns associated with the implementation of Blockchain technology in Ghana

It was discovered from the discussion that technology could increase banking services by permitting accessibility, openness, and affordability. One of the purposes is its capability to decrease costs for sustaining a bank account. Blockchain technologies can reduce transaction fees and quick payment time for worldwide settlement. Conversely, there are challenges that need to be overcome for its full implementation in Ghana. Evolving a blockchain-permitted system is a matter of high cost, and if the banking sector is to benefit from the technology, then it should be homogeneous throughout banks in the world. A further concern is the cost of energy required to power the blockchain systems, which affects the profit of most banks in Ghana. Blockchain eliminates the presence of an intermediary such as banks. It was also discovered that the absence of intermediaries like banks and other financial institutions could also bring about a loss of revenue. Another area of concern is the high rate of the underprivileged and the high rate of

illiteracy in Ghana. The conclusion is that for any technology to reach an acceptance and implementation level, it must be kept simple and easier for the underprivileged and illiterate to be able to make use of it.

The banking sector of Ghana being equipped to embrace blockchain technology

The findings of the research depict that inadequate access to funds, absence of infrastructure and tech support in Ghana, and lack of research and advancement support for utilizing such technologies comprise the largest obstacle to a vast extent of Blockchain technology adoption in the banking sector of Ghana. These obstacles may be strenuous to overcome by the government and the banking sector of Ghana. Alternatively, corporation-oriented strategy tools like fostering intermediary capital are more presumably to encourage blockchain investments. Action is required at the national level to eliminate the possible constraints of a technology shift. This action consists of the removal of technological and administrative barriers, building a steady macro-economic environment, and transparency.

Legal issues regarding the adoption of blockchain technology in Ghana

Another finding was that blockchain technology is perceived as advantageous but that the technology is not seen as prepared for implementation yet. Blockchain technology was uncovered as advantageous because of its capability to upsurge productivity using its technological features. In Ghana, the absence of standards or legislation for blockchain technology, it is perceived as the main challenge to the implementation of blockchain in the banking sector. Blockchain is perceived as a technology that is in its infant stage, therefore there is a detachment between dissimilar standards or legislation applied by all countries in the world. Therefore, there is need for a uniform regulated structure that will permit the system to develop. The study does nevertheless illustrate that even if the technical issues are resolved, there are issues of how the services should be legalized in an attempt to reach technology acceptance and implementation in Ghana.

Recommendations and suggestions for future research

There are numerous areas that are of importance to study in the future. This research is entirely qualitative with no quantitative components. Nevertheless, the structure of TAM deployed in this research is mostly carried out by quantitative analysis. Moving forward, this

research can be carried out with quantitative modus, to try to authenticate the findings in this study. Regulations should be formulated as soon as possible to enhance the rapid adoption of Blockchain technology in the banking sector. There turns to chaos in any society without regulations. Therefore, for Blockchain to be successful in the coming years, a formidable regulation governing its application in the financial sector should be made without delay. The additional principal viewpoint that this study lacks is financial inclusion. In future, it would be exciting if financial inclusion is researched and attempt should be made to ascertain what requirements blockchain solutions need to fulfil to include the banked and unbanked. The limitation of this research is the dependence on self-disclosed data. Another drawback of carrying out this kind of qualitative research is the challenge of trying to unconventionally authenticate the data and duplicate the outcomes (Robins et al., 2007). Hence, the same outcome may not be achieved anytime the research is duplicated.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interest.

REFERENCES

- Agbesi S, Tahiru F (2020). Application of Blockchain Technology in Land Administration in Ghana. DOI:10.4018/978-1-7998-3632-2.ch006.
- Ali O, Ally M, Clutterbuck, Dwivedi Y (2020). The state of play of blockchain technology in the financial services sector: A systematic literature review. *International Journal of Information Management* 54:102-199.
- Anagnostopoulos I (2018). Fintech and regtech: Impact on regulators and banks. *Journal of Economics and Business* 100:7-25.
- Bharti AK (2019). A study of emerging areas in adoption of blockchain technology and it's prospective challenges in India. In 2019 Women Institute of Technology Conference on Electrical and Computer Engineering pp. 146-153.
- Chen Y (2018). Blockchain tokens and the potential democratization of entrepreneurship and innovation. *Business Horizons* 61(4):567-575.
- Cucari N, Lagasio V, Lia G, Torriero C (2021). The impact of blockchain in banking processes: the Interbank Spunta case study. *Technology Analysis and Strategic Management* 2021:1-13.
- Dai J, Vasarhelyi MA (2017). Toward Blockchain-Based Accounting and Assurance. *Journal of Information Systems* 31(3):5-21.
- Deka GC, Kaiwartya O, Vashisth P, Rathee P (2018). Communications in Computer and Information Science. Applications of Computing and Communication Technologies Volume 899 (First International Conference, ICACCT 2018, Delhi, India, March 9, 2018, Revised Selected Papers) Blockchain Technology in Fund Management pp. 310-319.
- Drescher D (2017). Blockchain basics: a non-technical introduction in 25 steps, Apress, viewed November 23rd 2018, ISBN-10:1484226038.
- Farah NAA (2018). Blockchain technology: Classification, opportunities, and challenges. *International Research Journal of Engineering and Technology* 5(5):3423-3426.
- Fernandez-Vazquez S, Rosillo R, De La Fuente D, Priore P (2019). Blockchain in FinTech: A Mapping Study. *Sustainability* 11(22):6366.
- Frame W, Scott W, Lawrence J (2014). Technological change, financial innovation, and diffusion in banking. SSRN pp. 1-5.

- Gao W, Hatcher WG, Yu W (2018). A Survey of Blockchain: Techniques, Applications, and Challenges," 2018 27th International Conference on Computer Communication and Networks pp. 1-11.
- Gao Y (2021). A promising application prospect of Blockchain in the Banking Industry from the Perspective of Stakeholder Theory. Proceedings of the 1st International Symposium on Innovative Management and Economics pp. 161-165.
- Garg P, Gupta B, Chauhan A, Kumar S, Uthayasankar G, Shivam MS (2020). Measuring the perceived benefits of implementing blockchain technology in the banking sector. *Technological Forecasting and Social Change* 163:120407.
- Guo Y, Liang C (2016). Blockchain application and outlook in the banking industry. *Financial Innovation* 2(1):24-30.
- Hassani H, Huang X, Silva E (2018). Banking with blockchain-ed big data. *Journal of Management Analytics* 5(4):256-275.
- Ji F, Tia A (2021). The effect of blockchain on business intelligence efficiency of banks, *Kybernetes* pp. 1-10.
- Kaur H, Alam MA, Jameel, R, Mourya AK, Chang V (2018). A proposed solution and future direction for blockchain-based heterogeneous medicare data in cloud environment. *Journal of Medical Systems* 42:1-11.
- Kshetri N, Voas J (2018). Blockchain in developing countries. *IT Professional* 20(2):11-14.
- Kumar R, Tahir MF, Kumar S, Zia A, Memon H, Mahmood W (2019). Challenges in Adoption of Blockchain in Developing Countries. 2019 4th International Conference on Emerging Trends in Engineering, Sciences and Technology doi:10.1109/iceest48626.2019.81674.
- Liu T, Lin D (2021). Application and Prospect of Blockchain Technology in China's Commercial Banks. *Advances in Economics, Business, and Management Research*, volume 166. Proceedings of the 6th International Conference on Financial Innovation and Economic Development pp. 449-453.
- Mavilia R, Pisani R (2019). Blockchain and catching-up in developing countries: The case of financial inclusion in Africa. *African Journal of Science, Technology, Innovation and Development* 12(2):151-163.
- Mintah K, Baako KT, Kavaarpuo Godwin O, Gideon K (2020). Skin lands in Ghana and application of blockchain technology for acquisition and title registration. *Journal of Property, Planning and Environmental Law* 12(2):147-169.
- Musah S, Medeni TD, Soylu D (2019). Assessment of the Role of Innovative Technology through Blockchain Technology in Ghana's Cocoa Beans Food Supply Chains. 2019 3rd International Symposium on Multidisciplinary Studies and Innovative Technologies pp. 1-10.
- Nakamoto S (2008). Bitcoin: A peer-to-peer electronic cash system. Available at: <https://bitcoin.org/bitcoin.pdf>
- Niyitunga EB (2022). current and potential role of blockchain-based technology in managing medical records in Africa. *Digital Policy Studies*.
- Novak M, De Silva A (2019). Economics of Blockchain Technology. *Economic Papers. A Journal of Applied Economics and Policy* 38(2):73-73.
- Osmani M, El-Haddadeh R, Hindi N, Janssen M, Weerakkody V (2020). Blockchain for next-generation services in banking and finance: cost, benefit, risk, and opportunity analysis. *Journal of Enterprise Information Management* (In press).
- Papadaki M, Karamitsos I (2021). Blockchain technology in the Middle East and North Africa region. *Information Technology for Development* 27(3):617-634.
- Patki A, Sople V (2020). Indian banking sector: Blockchain implementation, challenges and way forward. *Journal of Banking and Financial Technology* 4(1):65-73.
- Peter H, Moser A (2017). Blockchain-Applications in Banking and Payment Transactions: Results of a Survey. *European Financial Systems 2017. Proceedings of the 14th International Scientific Conference*, Brno: Masaryk University, 2017, part 2, pp. 141-149.
- Rajnak V, Puschmann T (2020). The impact of blockchain on business models in banking. *Information Systems and e-Business Management* 19:809-861.
- Rejeb A (2018). Blockchain Potential in Tilapia Supply Chain in Ghana. *Acta Technica Jaurinensis* 11(2):104-118.
- Robins RW, Fraley RC, Krueger RF (2007). *Handbook of research methods in personality psychology*. The Guilford Press.
- Senou RB, Dégila J, Adjobo EC, Djossou APM (2019). Blockchain for Child Labour Decrease in Cocoa Production in West and Central Africa. *IFAC-Papers Online* 52(13):2710-2715.
- Sharma S, Arnab B, Himanshu S, Rohit P (2019). Strategy for Financial Inclusion of Informal Economy Workers. *Indian Council for Research on International Economic Relations*. Available at: <https://www.econstor.eu/handle/10419/203708>
- Song W, Li Y, Yang D (2018). Research on the Application of Blockchain in the Energy Power Industry in China. Available at: <https://dx.doi.org/10.1088/1742-6596/1176/4/042079>.
- Vovchenko NG, Andreeva AV, Orobinskiy AS, Filippov YM (2017). Competitive Advantages of Financial Transactions on the Basis of the Blockchain Technology in the Digital Economy. *European Research Studies Journal* 20:193-212.
- Wu T, Liang X (2017). IEEE 2017 12th International Conference on Computer Science and Education (ICCSE) - Houston, TX, USA (2017.8.22-2017.8.25)] 2017 12th International Conference on Computer Science and Education - Exploration and practice of inter-bank application based on block chain pp. 219-224.
- Yoo S (2017). Blockchain-based financial case analysis and its implications. *Asia Pacific Journal of Innovation and Entrepreneurship* 11(3):312-321.
- Zheng K, Zhang J, Chen Y, Wu Ji (2019). Blockchain adoption for information sharing: risk decision-making in spacecraft supply chain. *Enterprise Information Systems* 15(6):1-22.

Related Journals:

