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Impact of Sustainable Development Goals on Profitability: Evidence from Ghanaian Banks

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Abstract

This study investigates the impact of selected Sustainable Development Goals (SDGs), including poverty (SDG 1), health and well-being (SDG 3), quality education (SDG 4), and affordable clean energy (SDG 7), on the profitability of Ghanaian banks. By focusing on the mediating role of inadequate financing, the research aims to provide insight into the alignment between sustainable practices and financial performance. The study uses a mixed-method approach, relying on secondary data from international financial institutions and primary data collected through surveys of 350 respondents. The data is analyzed using Structural Equation Modeling (SEM) with AMOS and generalized linear modeling via SPSS. The findings emphasize the potential trade-off between achieving sustainability targets and immediate financial success, offering policy recommendations for promoting sustainable banking.

Keywords

SDG's, Financing, Profitability, Sustainable Banking Policies, Governance, Stakeholders

1. Introduction

Sustainable development goals are global goals that address fundamental human challenges and need to be supported at both local and sector levels. The banking and finance sector has a role to play in the adoption of these goals and in translating them into their practice to make an impact on communities. A clear example includes the support of microfinance and SMEs through a variety of loan products (Khandker et al., 1995; Weber & Remer, 2011) and the financing of energy initiatives (Zhang, 2021), these have the potential of showing banks commitment on environmental protection, poverty, the support of healthy society as well as the

provision of quality education for their stakeholders. These are necessities of lives, and the lack of them is considered a threat to livelihood and a human rights violation (Chirambo, 2018; Buhmann et al., 2019; Bouma et al., 2017).

Countries will require substantial financing to reach the 2030 target of sustainable development goals. Financial institutions, specifically banks, have a vital role to play in bridging the funding gap (Breuer et al., 2023). By taking proactive and sustainable measures, banks can contribute to operationalizing sustainable and inclusive development, ultimately helping to achieve sustainable development goals (Avrampou et al., 2019; Ganbat et al., 2016; Archer & Muntasim, 2020).

Few banks have demonstrated their commitment, aiming at different financing mechanisms such as loans and direct investments into renewables for the benefit of the clientele and helping to achieve global sustainability targets that align with the Paris Agreement (Elgouacem et al., 2020; Zimmermann, 2019; Venanzi & Matteucci, 2022). It is clear that banks that focus on the SDGs have the potential to meet their social and environmental expectations. This has a replicated effect on higher reputation and profitability (Stein & Sridhar, 2018; Ganbat et al., 2016). The IPCC report 2018 highlights that human activities are expected to accelerate global warming, leading to a temperature increase of 1.5 degrees Celsius above pre-industrial levels by 2030 to 2052. Addressing global warming requires significant social and business transformations and reductions in greenhouse gas emissions across all sectors. The scale of investment needed is substantial, with the IPCC report estimating a yearly investment of USD 2.4 trillion in clean energy until 2035. In this context, the role of banks and other financial institutions becomes crucial (Hoegh-Guldberg et al., 2019; Kaminker & Stewart, 2012; Field et al., 2012).

The banking sector has historically been instrumental in providing financial resources to various stakeholders, including the private sector, households, and individuals, in dealing with global warming for developed countries (Al Mamun et al., 2022; Yang, 2023) and developing countries like Ghana (Annim & Alnaa, 2013). As the mainstay of the real economy, banks possess the necessary resources and expertise to create financing solutions for transitioning to a green and sustainable economy (Al Mamun et al., 2022; Alharbi et al., 2023). Furthermore, the banking industry recognizes that compromising the environment and social well-being for economic growth is no longer sustainable and could affect their existence. As a result, they understand the imperative of sustainable development. By taking proactive and sustainable practices, leaders in financial institutions can pave the way for sustainable and inclusive development (Vasileiou et al., 2022; Chiaramonte et al., 2022). In this context, the role of institutional theory assumes greater importance than ever before. Institutional theory focuses on theorizing how social, cultural, and environmental norms, attitudes, and values influence the actions and consequences of organizations (Wibowo & Handika, 2017). It emphasizes the growing need for environmental stewardship from society and regulators, a critical component of institutional theory (Assoratgoon & Kantabutra, 2023). Following

this theory, in this paper, we shed light on the complex relationship between banking industry expectations and norms, company strategy, and the effects of SDG integration on profitability and operational management practices.

Banks may also help reduce poverty while profiting from institutional norms via innovative products such as microloans, affordable banking services, and inclusive finance initiatives (Archer & Muntasim, 2020). Banks have the capacity to fund educational programs via loans, scholarships, and other financial assistance (Archer & Muntasim, 2020). Banks are also extending credit for renewable energy projects to meet renewable energy needs (Zhang, 2021; Sautner et al., 2023; Samour et al., 2022). However, from a research and policy perspective, it is essential to understand how the integration of sustainable practices affects the financial performance of banks.

While there have been previous studies on the impact of sustainable practices on profitability (Duflo et al., 2021), most of these studies have considered various aspects of the 17 Sustainable Development Goals from the perspective of both developed and developing nations, hence the failure to address the basic needs that affect most developing nations like Ghana. Our study focuses on poverty reduction strategies (SDG 1), educational support (SDG 4), and health and well-being (SDG 3) coupled with the provision of affordable clean energy (SDG 7), which are necessities of the life of humanity affecting the vulnerable in Ghana. Financing the mentioned SDGs would be beneficial to the masses, especially the Ghanaian population and the African region as a whole. In addressing this vacuum, in this paper, we study the influence of the four (4) selected SDGs on Ghana's banking sector. The banking sector in Ghana is increasingly becoming more environmentally concerned due to public pressure, government laws, and international norms (Ramcilovic-Suominen & Epstein, 2015; Liu & Li, 2022; Zhou et al., 2023). With a focus on Ghanaian banks, we investigate in this study the benefits and drawbacks of incorporating SDGs into Ghanaian banking operations and how they impact banks' profitability.

To provide a comprehensive picture of the impact of sustainable development projects on bank profitability in Ghana, we employed a mixed-method strategy that combines primary survey data (350 responses) with secondary financial data (World Bank and IMF). We collected responses from 350 respondents working in the Ghanaian banking sector. The data analyses are done using structural equation modeling (SEM). Our results suggest a possible trade-off between satisfying specific sustainability targets and immediate financial success, but the challenge to balance sustainability initiatives in the banking industry coupled with profitability, shedding more light on caring for the community and the environment for the benefit of the majority.

From a policy perspective, the findings of these studies shed light on policymakers advocating for sustainable banking policies. It emphasizes that knowing the specific SDGs that affect a bank's financial performance can be valuable. This information enables them to make a more persuasive case to stakeholders such as

investors, consumers, and regulatory agencies. By highlighting the alignment between sustainable practices and profitability, they can effectively communicate the benefits of sustainable banking, which is imperative for developing nations.

2. Literature Review

Bradley (2022) contends that institutional theory allows a comprehensive examination of the sustainability practices in banking from different levels. Bradley distinguishes three levels of institutional theory: the macro-level (regulatory frameworks and international standards), the meso-level (industry associations and peer influences), and the micro-level (bank-specific strategies and practices). This multilevel perspective enables a more comprehensive understanding of the drivers of sustainable banking and outcomes. The role of institutional theory in sustainable banking is prominent in the literature. For example, "how institutions matter in common-pool resource governance" was suggested as one of three research frontiers by Karbhari et al. (2020). "Originating in institutional theory that focuses on theorizing interactions among formal, sovereign systems, society, and the environment." As such, the theory addresses how the formal legal-political system engages with the natural environment. In discussing the institutional theory of sustainability and stakeholder pressure, Bissoondoyal-Bheenick et al. (2023) concentrated on the institutional pressures to which the bank yielded and decoupled its decision-making process from its sustainable practices, how it responded based on formal rules, and how it behaved according to socially generated expectations, which in turn represent adherence to the third and fourth (Ushakov et al., 2023). In summary, banks conform to socially generated expectations and those of the formal institutional environment. Instituted elements are expected to align with public expectations and standards in a socially organized context. Lastly, to avoid penalties and comply with the increasing social expectations of the institutional norms. Thus, by operationally standardizing, banks' practices and strategies reflect socially organized beliefs and conventions, institutional expectations, and regulatory requirements.

The theory, in a broader sense, considers social and environmental norms in addition to international standards and principles like Global Reporting Initiatives (GRI) and UN Principles for Responsible Investments (UNPRI). This needs to be entirely accepted by the management of banks in helping to maintain compliance on specific SDGs and its initiatives by all parties, especially the customers (Sievänen et al., 2013; Hák et al., 2016; Journeault et al., 2021). The theory suggests that the management of banks and interested groups need to be compliant with the directives in helping to protect both the integrity of banks and that of the communities (their major stakeholder), especially from risks associated with borrowed funds from the banks for unsustainable investments (Ahmad & Zabri, 2016; Mähönen & Cullen, 2019). The academic literature on institutional theory and sustainable banking helps to elucidate the mechanisms through which banks navigate and respond to institutional pressures related to sustainability. It contributes to a

better understanding of the role institutions play in shaping banks' strategic and operational decisions and their efforts towards sustainable development. We consider this theory appropriate for our study, and we develop our hypotheses based on it.

2.1. Development of Hypotheses

2.1.1. Health and Well-Being (SDG3)

The health-and-well-being-related (SDG3) is a broader societal challenge in Ghana, which is important and urgent (Glass & Newig, 2019). Ghana faces difficulty in ensuring universal access to high-quality medical services, including primary healthcare, which is why rural and remote areas again serve as the bulk of insufficient social security nets (Moussa et al., 2022). The lack of medical facilities, hospitals, the spread of already lethal diseases, the cost of services, and the lack of highly skilled professionals who prefer to work in countries with higher prospects and more stable development become a matter of concern. The point of highly qualified medical staff and assistants are mostly needed to achieve SDG 3 (Siranova et al., 2021). It is necessary to build the achievement of the first two goals not only on their basis but also on consensus. The account is that, this is not only the achievement of the targets with which there is an account share on the topline but also the social issues in the presupposition of health and working conditions (Shome et al., 2023). The reason for the banking sector to be involved in achieving the health-related (SDG3) target lies in the supposition of the institutional theory, which contends that the behavior of an organization is sufficiently framed with the intangible but still constraints as societal expectations and stakeholder demands (Sabatino et al., 2019). As society is becoming increasingly concerned about well-being problems on the demand side, so shall the banks react to stakeholders (Subramaniam et al., 2023). Banks can contribute to the achievement of SDG 3 through the provision of all forms of active and financial interaction with all parties in need of healthcare. Along with improving existing laws, banks can directly participate in the construction of new medical facilities, and the modernization of existing facilities that will serve its purpose in Ghanaian communities. (Van Zanten & van Tulder, 2018). Banks can also contribute, with income from interest and fees, to cater for health insurance (Peter et al., 2016). Although the state has a responsibility for this and other health infrastructure, banks have a social responsibility and can assume a primary duty to implement immunization, welfare care measures and explain the hygienic personal espionage to their clientele (Krech et al., 2018; Sabatino et al., 2019). Banks can support capacity building and training for health professional, and this can be done with colleagues from NGOs under support programs in Ghana, providing financial aid to healthcare professionals as well as the usage of training kits (Widarni & Bawono, 2022). Analyzing the outcome of such initiatives and bank engagements in healthcare, will build stronger reputation amongst their customer and sell their brand to stakeholders in the long run (Ganbat et al., 2016; Biswas, 2011). The banks getting

involved will not only help achieve reputation but serve as actual possession of funds for construction in allowing more talented people to benefit from good initiatives. In this regard, their stakeholders' need is clearly registered here (Stein & Sridhar, 2018; Breuer et al., 2023). This communicates the trust that, hospitals have been built and medical equipment provided for their well-being (Jiménez-Aceituno et al., 2020). Consequently, we posit our first hypothesis:

H1: There is a positive relationship between Sustainable Development Goal 3 and Profitability.

2.1.2. Education (SDG 4)

SDG 4 is a global goal set by the United Nations. It targets every nation to ensure inclusive and equitable education, promoting lifelong learning opportunities for all. This goal seeks to improve access to education, enhance the quality of education, and increase the number of people with access to lifelong education (Duflo et al., 2021). SDG 4 is expected to achieve the following targets by 2030: Ensuring that all children have access to free and compulsory primary and secondary education; increasing the number of trained and tutors; ensuring that knowledge and skills are available to others and allowing Ghana to increase employment and daily life skills (Shatila et al., 2024). According to the above criticisms, Ghana has made significant progress in improving its education system. The country has devised a mechanism to promote the above-mentioned challenges (Moussa et al., 2022); these include investment in policies and reformed infrastructure, the development of a teacher training plan and legal provision by creating access to the internet for the children in the country (Israilova et al., 2023). However, there are other attempts to improve the education system which should not go unnoticed. First, the administration increased the money for the educational sector and students by a percent of its national budget (Duflo et al., 2021). In continuation, the above efforts cannot be successful without the assistance of banks. The banks can identify their daily work from an institutional perspective. As their ability to provide resources for SDG 4 that are more constructive at an early stage. Banks can work with the central government and responsible ministries in charge of education to push for laws and regulations that allow harmony to flourish, supporting integration quality and assisting teaching and learning (Siranova et al., 2021). Systemic, practical ways have been identified where financing can increase, and the extent banks can support. This could positively affect the comfort of the person in question and the level of schooling (Duflo et al., 2021). Banks spending on the SDG 4 and its objectives will result in long-term benefits. Academic work improves individual lifestyle and the standard of business. The study further noted success in the sustainability group's output. In this way, despite the potential hazards, they demonstrate a sustainable income community. Financing SDG 4 has resulted in more successful cooperation and without any immediate payments. Based on the above arguments, we posit our second hypothesis:

H2: There is a positive relationship between Sustainable Development Goal

4 and the profitability of banks.

2.1.3. Poverty (SDG 1)

SDG 1 is a global goal set by the United Nations; its overall goal is to end poverty in all its forms everywhere. Within Ghana, SDG 1 entails ending poverty while significantly reducing intra-country household disparities (Al Mamun et al., 2022). The target has specific dimensions: ensuring everyone is covered by a social protection system, equal rights to economic resources, including land and essential services, complete coverage of all aspects of the goal, and so on. Ghana has made some progress on poverty reduction in recent times (Alharbi et al., 2023). Notwithstanding, there is the existence of disparities in poverty levels across the country, with the majority residing in rural areas amongst these categories being the marginalized people experiencing modern slavery because of poverty. According to the Institutional Theory, Banks in Ghana can leverage their resources, knowledge, and networks to ensure that SDG 1 is attained (Chiaramonte et al., 2022). Through the poverty reduction framework, responsible lending, and exceptional payment practices, they were ensuring complete coverage of the financial inclusion of those currently bound by financial exclusion and increased investment in the sustainable livelihoods of individuals and communities in Ghana. Banks can have a significant and direct effect on poverty reduction, and the general economic and social development of Ghana with their initiatives (Sautner et al., 2023). Additionally, microfinance, a product of most banks, is still fundamental to poverty reduction in Ghana. Microfinance can provide financial services to the unbanked, changing the lives of the world's most disadvantaged people, in particular. Theoretically, investments in microfinance and other poverty-reduction policies can result in increased profits for the bank, an expanded and more loyal customer base, lower operational costs, intangible social and reputational benefits (Annim & Alnaa, 2013; Mohamed & Fauziyyah, 2020; World Bank Group, 2016).

Following the above arguments, we posit our third hypothesis:

H3: There is a positive relationship between Sustainable Development Goal 1 and profitability.

2.1.4. Affordable and Clean Energy (SDG7)

SDG 7 is one of the goals set by the United Nations in their 2030 Agenda for Sustainable Development. SDG 7 aims to ensure access to affordable, reliable, sustainable, and modern energy for all. The goal focuses on promoting clean energy sources, increasing energy efficiency, and expanding access to electricity to support economic development, improve healthcare and education, and combat climate change (Samour et al., 2022). Like most African countries, Ghana faces several challenges related to achieving SDG 7, which focuses on ensuring access to affordable and clean energy. Efforts are being made to address these challenges through various initiatives, including increasing investments in renewable energy, improving energy efficiency, promoting off-grid solutions, and fostering regional

cooperation for energy access. Partnership between governments, international organizations, development agencies, and the financial sector is crucial for overcoming these challenges and achieving SDG 7 in Ghana. Banks can provide financial support and investment for renewable energy projects in Ghana. This can include funding for solar power installations, wind farms, hydroelectric projects, and other clean energy initiatives. By offering loans, credit facilities, and project financing, banks can help accelerate the deployment of renewable energy solutions and expand access to clean and sustainable energy sources (Shome et al., 2023). Banks can develop and promote products tailored towards financing energy-efficient technologies and renewable energy systems. These can include, leasing options, and financial incentives for customers to invest in energy-efficient appliances, solar panels, and other clean energy solutions. Banks can also partner with energy service companies and manufacturers to provide competitive financing for clean energy products and services (Subramaniam et al., 2023). Investing in SDG7 can contribute to banks' profitability by creating new revenue streams, reducing risks, enhancing reputation, complying with regulations, and achieving cost savings (Archer & Muntasim, 2020). Consequently, we posit our fourth hypothesis:

H4: There is a positive relationship between Sustainable Development Goal 7, profitability and customer benefits.

2.1.5. Access to Finance and Its Impact on Sustainability Practices

Limited access to finance is often considered a barrier to sustainability practices in both Ghanaian and African banks (Schwerhoff & Sy, 2017). Unlike European banks, the policy and regulatory environment in some African countries may not be conducive to promoting sustainability practices effectively (Flamini et al., 2009; Kiyota, 2011). A lack of clear and supportive policies, incentives, or regulations can discourage banks from investing in sustainability or incorporating sustainability into their lending practices (Schwerhoff & Sy, 2017). Some banks may also lack awareness and understanding of sustainability practices, benefits and potential financial returns. Additionally, they may lack the internal expertise and capacity to develop and implement sustainable initiatives effectively. This can create further barriers to accessing finance for sustainability (Ongore & Kusa, 2013; Shulla et al., 2020). Ghanaian banks may perceive sustainability practices as high-risk ventures, mainly if they are unfamiliar with the associated technologies or lack proven business cases in the local context (Tohănean et al., 2018; Samour et al., 2022). Financing SDG, s has become a more significant burden for most economies, of which African countries are no exception (McIntyre et al., 2018; Mills et al., 2012). This is seen as a trend negatively impacting specific SDG, such as basic healthcare needs and the achievement of public healthcare, which is supposed to be the right of citizens (Mtei et al., 2012). Affluent economies are at the advantage of financing the SDG, s over developing economies due to a lack of access to finance and limited resources to finance SDG related targets, such as quality education, teaching, research, and innovation; these impede the progress of sustainability

(Mawdsley, 2018; Archer & Muntasim, 2020). According to UN-Energy, 2005, inadequate funding of renewable energy sources thwarts the effort to achieve cleaner and more sustainable energy for the ordinary, who finds it difficult to access electricity (Chirambo, 2018; Eras-Almeida & Egido-Aguilera, 2020). Banks with limited access to finance may struggle to allocate adequate resources to support social initiatives to achieve specific SDG goals. This includes funding for education, healthcare, energy, and other essential services for poverty alleviation (Cai et al., 2020).

Hence, we posit our remaining hypothesis:

H5: Limited access to finance negatively affects bank sustainability practices.

H6: Negative relationship between SDG1 and Lack of Finance.

H7: Negative relationship between SDG3 and Lack of Finance.

H8: Negative relationship between SDG4 and Lack of Finance.

H9: Negative relationship between SDG7 and Lack of Finance.

Section 2 presents a comprehensive review of institutional theory and its relevance to sustainable banking. It discusses how the SDGs intersect with banking practices, focusing on poverty alleviation, health and well-being, education, and clean energy. The review identifies existing research gaps concerning the impact of these SDGs on bank profitability, particularly in the Ghanaian context. It also highlights how institutional pressures drive banks to integrate sustainable development into their operations, affecting financial performance and stakeholder engagement.

3. Methodology

This study adopts a quantitative research design to analyze the relationship between the selected SDGs and bank profitability. By integrating both primary and secondary data, the study ensures a robust examination of the subject matter. Primary data was collected through a structured survey distributed to 350 banking professionals in Ghana, while secondary data was sourced from the World Bank, IMF, and Bank of Ghana reports. The survey employs a Likert scale to quantify respondents' perceptions of the impact of SDGs on profitability. The study utilizes Structural Equation Modeling (SEM) and SPSS for detailed data analysis, ensuring the results are both reliable and generalizable.

This study examines how SDG1, SDG3, SDG4, and SDG7 affect the profitability of banks in Ghana. The research uses a mixed-methods strategy, gathering information from primary and secondary sources (Hair et al., 2013). Secondary data contains financial performance indicators gathered from reliable sources like the World Bank and the International Monetary Fund (IMF), while preliminary data is collected via surveys of 350 respondents. Structural equation modeling (SEM) uses AMOS for further in-depth data analysis, whereas generalized linear modeling uses SPSS. Most of the data included in this research comes from surveys. We have created a structured survey to gather more data on how Ghanaian bankers see the impact of SDGs on their profitability (Hair et al., 2013). These SDGs seek

to end poverty, achieve gender equality, guarantee every child access to quality education, and make energy more affordable. Three hundred fifty people with stakes in Ghana's banking system participated in the research. The study uses a Likert scale to collect numerical answers from individuals on how they assess SDGs' effect on banks' profitability. We employ statistical software SPSS to analyze the data. We first explain our descriptive statistics using frequencies, standard deviations, and averages. We utilize inferential statistics like regression and correlation analysis to see how the public feels about banks' profitability concerning the seven chosen SDGs. Utilizing structural equation modeling (SEM) in AMOS, we construct and test a comprehensive model that assesses the SDGs' direct and indirect effects on banks' profitability (Collier, 2020). Through SEM, intricate interrelationships between many factors may be investigated simultaneously (Collier, 2020). Banks' profitability in Ghana is quantitatively assessed by analyzing secondary data on Ghanaian banks' financial performance measures (ROE, ROA, and ROI). Ethical issues are crucial in the data-collecting process. All survey takers provide informed permission, guaranteeing they voluntarily give their time and effort. Respondents' Information will be kept anonymous and confidential (Hair et al., 2013).

The following section of the paper covers descriptive statistics, confirmatory factor analysis, reliability analysis, model fit, and path analysis. **Table 1** presents a gender-based distribution of a sample of 350 individuals. It shows that males constitute a more significant portion of the sample, with 221 individuals making up 63.1%. Females are represented by 129 individuals, accounting for 36.9%. The 'percent' and 'valid percent' columns indicate the same values, implying no missing or invalid responses in the data. The 'cumulative percent' column cumulatively adds the percentages, reaching 100% with the inclusion of both genders, reflecting the entire sample. This distribution highlights a significant gender disparity in the sample, with a notable majority of male participants.

Table 1. Gender distribution.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	221	63.1	63.1	63.1
	Female	129	36.9	36.9	100.0
	Total	350	100.0	100.0	

Source: Authors' database.

The data in **Table 2** categorizes the ages of 350 individuals into five distinct groups. The largest age group is 26 - 33 years, encompassing 117 individuals (33.4% of the total sample). The 34 - 41 years group follows, with 97 individuals representing 27.7%. The 18 - 25 age group has 59 individuals (16.9%), while the 42 - 50 age group includes 50 individuals (14.3%). The smallest group is those

aged 51 and above, comprising 27 individuals (7.7%).

Table 2. Classification of age of data sample.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18 - 25	59	16.9	16.9	16.9
	26 - 33	117	33.4	33.4	50.3
	34 - 41	97	27.7	27.7	78.0
	42 - 50	50	14.3	14.3	92.3
	51 and above	27	7.7	7.7	100.0
	Total	350	100.0	100.0	

Source: Authors' work.

Table 3 presents the work experience distribution of a sample of 350 individuals. Most of the sample falls within the 5 - 10 years' experience range, with 242 individuals accounting for 69.1%. The next largest group is those with 10 - 15 years of experience, comprising 49 individuals or 14.0%. The 1 - 5 years' experience category includes 35 individuals (10.0%), and the 15 - 20 years group is the smallest, with 24 individuals making up 6.9% of the sample. The percentages in the 'percent' and 'valid percent' columns are identical, indicating the absence of missing or invalid data.

Table 3. Work experience of data sample.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 - 5 years	35	10.0	10.0	10.0
	5 - 10 years	242	69.1	69.1	79.1
	10 - 15 Years	49	14.0	14.0	93.1
	15 - 20 years	24	6.9	6.9	100.0
	Total	350	100.0	100.0	

Source: Authors' work.

Table 4 presents factor loadings from a confirmatory factor analysis related to SDGs 1 and 3. Factor loadings are statistical measures that show how well each item (e.g., SDG1_1, SDG1_2) represents the underlying factor it is supposed to measure. For SDG 1, six items are listed with their respective loadings. Items SDG1_1 (0.708), SDG1_3 (0.867), SDG1_4 (0.919), SDG1_5 (0.822), and SDG1_6 (0.788) all have factor loadings above 0.7, indicating a strong relationship with the underlying factor. However, SDG1_2 (0.365) has a loading significantly below 0.7, suggesting a weaker relationship, and thus, it could be considered for exclusion from further analysis. In the case of SDG 3, eight items are presented. Items

SDG3_1 (0.879), SDG3_3 (0.862), SDG3_4 (0.837), and SDG3_6 (0.869) demonstrate high loadings, indicating a solid representation of the underlying factor. The loadings for SDG3_2 (0.549), SDG3_5 (0.155), SDG3_7 (0.580), and SDG3_8 (0.645) fall below the 0.7 threshold. Notably, SDG3_5's loading is particularly low, suggesting a fragile relationship with the factor. These items, with loadings less than 0.7, might be considered for exclusion based on the established criteria for this analysis. Table 5 displays the factor loadings for items related to SDGs 7 and 4 as part of a dimension reduction process in confirmatory factor analysis. For SDG 7, eight items are presented with their respective loadings. Items SDG7_1 (0.774), SDG7_4 (0.835), SDG7_5 (0.766), and SDG7_8 (0.787) exhibit factor loadings above 0.7, indicating a strong correlation with the underlying factor. SDG7_2 (0.617), SDG7_6 (0.629), and SDG7_7 (0.590) have loadings below the 0.7 threshold but are still moderately high. In contrast, SDG7_3 (0.264) has a significantly low factor loading, suggesting a weak relationship with the underlying factor, and it could be considered for exclusion from the analysis. Regarding SDG 4, seven items are listed. SDG4_4 (0.778), SDG4_5 (0.778), SDG4_6 (0.812), and SDG4_7 (0.895) have high factor loadings, showing a solid representation of the underlying factor. However, SDG4_1 (0.681) is just below the 0.7 cutoff, while SDG4_2 (0.514) and SDG4_3 (0.349) have relatively lower loadings. Mainly, SDG4_3, with its notably low factor loading, might be considered for exclusion based on the criteria for this analysis.

Table 4. Confirmatory factor analysis.

SDG 1	Factor Loadings
SDG1_1	0.708
SDG1_2	**0.365**
SDG1_3	0.867
SDG1_4	0.919
SDG1_5	0.822
SDG1_6	0.788
SDG 3	**Factor Loadings**
SDG3_1	0.879
SDG3_2	0.549
SDG3_3	0.862
SDG3_4	0.837
SDG3_5	**0.155**
SDG3_6	0.869
SDG3_7	**0.580**
SDG3_8	0.645

Source: Authors' database.

Table 5. Dimension reduction.

SDG 7	Factor Loadings
SDG7_1	0.774
SDG7_2	0.617
SDG7_3	**0.264**
SDG7_4	0.835
SDG7_5	0.766
SDG7_6	0.629
SDG7_7	**0.590**
SDG7_8	0.787
SDG 4	**Factor Loadings**
SDG4_1	0.681
SDG4_2	**0.514**
SDG4_3	**0.349**
SDG4_4	0.778
SDG4_5	0.778
SDG4_6	0.812
SDG4_7	0.895

Source: Authors' database.

The confirmatory factor analysis and reliability assessment (refer to Table 6) for various SDGs reveal insightful trends. In factor loadings, SDG 1 and 3 items mostly demonstrate strong correlations with their respective factors, except SDG1_2 and several SDG3 items that fall below the 0.7 threshold, suggesting potential exclusion from the analysis. SDG 7 and SDG 4 also show a mix of high and moderate loadings, with SDG7_3 and SDG4_3 notably underperforming, again indicating candidates for exclusion. All SDGs exhibit acceptable internal consistency in terms of reliability, assessed through Cronbach's Alpha. SDG1 stands out with an exceptionally high Alpha of 0.862, indicating solid reliability, while SDG4, SDG3, and SDG7 follow with good, albeit comparatively lower, Alpha values of 0.752, 0.736, and 0.717, respectively. This comprehensive analysis underscores the varying degrees of factor representation and internal consistency across different SDG-related items.

Table 6. Reliability analysis.

	Cronbach's Alpha
SDG1	0.862
SDG4	0.752
SDG3	0.736
SDG7	0.717

Source: Authors' work.

Table 7 displays various model fit indices for a default model, indicating mixed results in its adequacy. The Normed Fit Index (NFI) and Relative Fit Index (RFI) are 0.992 and 0.982, respectively, both higher than the optimal threshold of 0.90, suggesting the model fit is excellent. The Incremental Fit Index (IFI), Tucker-Lewis Index (TLI), and Comparative Fit Index (CFI) present better outcomes with values of 0.920, 0.928, and 0.912, respectively, nearing or surpassing the 0.90 benchmark, indicating an adequate fit. These indices collectively suggest that while the model demonstrates specific strengths, particularly in incremental and comparative fit measures, there is room for improvement in the overall model fit as indicated by the lower NFI and RFI values.

Table 7. Model fit.

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	0.992	0.982	0.920	0.928	0.912

Source: Authors' work.

The path analysis in Table 8 reveals distinct relationships between SDGs 1, 4, 3, 7, one mediator and dependent variable: Lack of Finance (LoF) and Profitability. For LoF, all SDGs exhibit inverse relationships: SDG1 (−0.263), SDG4 (−1.590), SDG3 (−0.481), and SDG7 (−0.470), all significant beyond the 0.001 level, indicating substantial negative impacts. In contrast, the paths from these SDGs to profitability are positive, with SDG1 (0.252), SDG4 (0.726), SDG3 (0.586), and SDG7 (0.322) showing beneficial effects, again with significant critical ratios. Additionally, there is a notable inverse relationship between LoF and profitability (−0.229), suggesting that as LoF decreases, profitability increases. These results highlight a complex interaction between SDGs and organizational outcomes, with varying effects on LoF and profitability.

Table 8. Path analysis.

			Estimate	SE	CR	P
LoF	<---	SDG1	−0.263	0.074	−3.531	***
LoF	<---	SDG4	−1.590	0.122	−13.043	***
LoF	<---	SDG3	−0.481	0.103	−4.673	***
LoF	<---	SDG7	−0.470	0.068	−6.863	***
Profitability	<---	SDG1	0.252	0.013	19.384	***
Profitability	<---	SDG4	0.726	0.211	3.440	***
Profitability	<---	SDG3	0.586	0.230	2.547	***
Profitability	<---	SDG7	0.322	0.110	2.927	***
Profitability	<---	LoF	−0.229	0.019	−12.052	***

Source: Authors' database.

4. Analysis of Result

Before delving into the results, it is essential to understand the underlying dynamics between the selected SDGs and profitability. The analysis seeks to explore

whether banks that invest in sustainable practices, such as poverty reduction initiatives, educational support, healthcare, and clean energy, experience improved financial performance. This section introduces the key variables, providing context on how each SDG aligns with banking operations in Ghana. By focusing on profitability, the study aims to demonstrate the tangible benefits of sustainable development initiatives for financial institutions.

For this study, we developed nine main hypotheses. The hypotheses test results are summarized in Table 9 below.

Table 9. Hypotheses summary.

Hypothesis	B	Sig	Validation	Supported by
H1: There is a positive relationship between Sustainable Development Goal 3 and Profitability.	0.586	***	Validated	Adams & Acheampong (2019)
H2: There is a positive relationship between Sustainable Development Goal 4 and profitability of banks	0.726	***	Validated	Agarwal et al. (2022)
H3: There is a positive relationship between Sustainable Development Goal 1 and profitability	0.252	***	Validated	Karbhari et al. (2020)
H4: There is a positive relationship between Sustainable Development Goal 7 and profitability	0.322	***	Validated	Hutsaliuk et al. (2020)
H5: Limited access to finance negatively affects bank profitability	−0.229	***	Validated	Karbhari et al. (2020)
H6: Negative relationship between SDG1 and Lack of Finance	−0.263	***	Validated	Archer & Muntasim (2020)
H7: Negative relationship between SDG3 and Lack of Finance	−0.481	***	Validated	Bissoondoyal-Bheenick et al. (2023)
H8: Negative relationship between SDG4 and Lack of Finance	−1.590	***	Validated	Hutsaliuk et al. (2020)
H9: Negative relationship between SDG7 and Lack of Finance	−0.470	***	Validated	Adams & Acheampong (2019)

Source: Authors' work.

5. Discussion of Findings

The results demonstrate that banks integrating sustainable practices aligned with SDGs 1, 3, 4, and 7 can achieve improved financial performance by fostering positive social and environmental impacts. Specifically, banks that actively engage in providing affordable health services, improving educational access, and investing in renewable energy solutions not only contribute to societal development but also enhance their reputation and customer loyalty, leading to increased profitability. Nevertheless, the analysis also underscores the difficulties posed by limited financial resources, which particularly hinder efforts toward poverty alleviation. These

challenges highlight the need for strategic partnerships, better access to funding, and favorable regulatory frameworks to fully unlock the financial benefits of sustainability-driven initiatives in the banking sector.

This study was conducted to study the impact of SDG goals on Ghanaian banks' profitability. We employ institutional theory to develop and test our developed hypotheses. According to institutional theory, organizations are influenced by the social and cultural norms, rules, and expectations within their institutional environment (Adams & Acheampong, 2019). Institutional theory highlights the importance of financial institutions and their investment in SDGs to maintain external legitimacy, comply with regulations, meet stakeholder expectations, manage risks, and gain a competitive advantage (Karbhari et al., 2020). By aligning with sustainability's social and cultural norms, financial institutions such as banks can contribute to positive societal and environmental outcomes while safeguarding their long-term success and profitability. Our study contributes to the institutional theory and the literature from an African perspective. We find that there is a positive relationship between SDG3 and profitability. Banks from Ghana are providing affordable and adequate healthcare facilities for both customers and their employees. They are involved in community and wellness programs. Sustainable development, in which economic expansion does not come at the price of social and environmental health, is consistent with this mutually beneficial outcome. The findings of this study align with the findings of Jiménez-Aceituno et al. (2020) and Journeault et al. (2021).

Examining banks in Ghana further demonstrates the significant association between SDG4 and profitability. Banks in Ghana that invest in educational initiatives and their employees' careers are more likely to succeed economically because these beneficiaries get better service while business runs more efficiently. If the banks make investments in their employees' education and career growth, it might lead to improved risk management and the introduction of new and exciting financial products, which could increase earnings. This study's findings align with those of Hutsaliuk et al. (2020) and Karbhari et al. (2020). This led to the validation of our second hypothesis.

The reduction of poverty and the growth of economic participation are two of the main objectives of SDG 1. Banks in Ghana play a crucial role in expanding access to banking services for underserved and vulnerable areas. They are extending loans to microfinance businesses in low-income communities, providing public education on managing finances, and availing low-interest banking services. In this regard, banks gain two significant advantages: first, helping the economically disadvantaged via initiatives like micro-loans and small company loans and improving customer loyalty due to good publicity; this also fulfills their corporate social responsibility duties. In this way, the bank's profitability may be enhanced by increased trust, customer retention, and market share, all of which are effects of a good public perception of the bank's commitment to poverty reduction. These results demonstrate the interdependence between SDG1 (poverty alleviation) and

the profitability of banks in Ghana. It validated our third hypothesis. SDG 7 emphasizes the importance of reliable and sustainable energy sources, which are crucial for the efficient operation of banks. In Ghana, there are challenges such as frequent power outages and unreliable energy supply. Banks investing in sustainable energy solutions, such as solar power or energy-efficient infrastructure, can reduce operational costs and ensure continuous service delivery. This enhanced operational efficiency directly contributes to increased profitability. This led to the validation of the fourth hypothesis, which is also consistent with the findings of (Archer & Muntasim, 2020; Bah et al., 2018). Indeed, when banks actively support projects that promote sustainable energy practices, they help create a conducive environment for business growth, which can lead to an increase in their customer base and lending opportunities, ultimately bolstering profitability. Financing sustainable energy projects in Ghana may help the economy expand and improve the country's energy security.

Understanding the relationship between LoF and profitability is crucial for aspiring Ghanaian bankers. Ghanaian banks are much like their developing-world counterparts in caring for the community and the environment. One possible explanation for the negative relationship between LoF and ROI is that achieving the SDGs requires investing in eco-friendly policies and practices. Today's Investment decisions may not pay off in the short term, but they might boost operational efficiency, customer retention, and brand value in the long run. Through the strategic management of sustainability programs, Ghanaian financial institutions face the difficult task of balancing the demands of their profitability with those of the nation's economic and social progress. The decline in the value of banks' assets can cause financial difficulties. Financial institutions are already facing challenges to their profitability due to stricter risk management processes and the higher reserves required to cover defaults. This means that a loss in profitability, a popular measure, can result from a rise in LoF, which might signify a more significant commitment to SDGs and presumably higher operational expenses connected with such commitments. This conclusion suggests a possible trade-off between satisfying specific sustainability targets and immediate financial success. Thus, the fifth hypothesis is validated, showing a negative relationship between access to finance and bank profitability (ROI).

Lastly, we find an apparent inverse relationship between inadequate financial resources and Sustainable Development Goal 1 (SDG 1), which aims to eradicate poverty in all forms. Several significant elements provide insight into this negative correlation. The reduction of poverty and the growth of economic participation are two of the main objectives of SDG 1. Conversely, communities and individuals can only progress economically if they have access to finances. People need help with starting or business expansion, funding their education, or dealing with unexpected expenses, but there is a high cost of credit and other financial services. Achieving SDG 1 and lifting people out of poverty requires more access to financing needs. Lack of access to loans and other financial services makes it difficult for

small enterprises to expand or even remain in operation, restricting their capacity to generate revenue and employ people and further undermining the goals of SDG 1. The idea that inadequate financing contradicts Sustainable Development Goal 1's (SDG1) principal aim of ending poverty (H6) is widespread but needs to be corrected. This assertion suggests that, SDG1 should be fast-tracked if finance becomes available in addressing issues like limited access to credit and financial services. Banks in Ghana need to fight poverty and increase access to banking services to help the economy to flourish. Goal 1 of the Sustainable Development Agenda is to improve people's and communities' financial ecosystems to end poverty and all its manifestations, often linked to insufficient financial resources. This link becomes even more significant when seen through the lens of Ghana's monetary system. The above findings align with Adams & Acheampong (2019) and Agarwal et al. (2022) and also validate our sixth hypothesis, showing a negative relationship between SDG1 and lack of finance.

The analysis confirms a positive relationship between bank profitability and SDGs 1, 3, 4, and 7, highlighting the importance of integrating sustainable practices into banking operations. Banks that support health and education, offer services to underserved populations, and invest in clean energy initiatives show enhanced profitability. However, inadequate access to finance poses a significant challenge, particularly for projects related to poverty reduction. These findings suggest that while sustainability initiatives offer long-term benefits, they require substantial initial investments and supportive financial environments.

6. Limitations, Implications and Policy Recommendations

After realizing the impacts of the Sustainable Development Goals on banking profitability in the Ghanaian banking sector, we did not overlook the limitations that may impact the validity and generality of our findings. First, we considered a sample size and the population, basically from selected Ghanaian banks and practitioners, looking at their perception of Sustainable Development Goals (SDGs) and the impact on profitability. Again, few SDGs were considered among the 17 Sustainable Development Goals in our approach to measuring banking profitability. This is because the selected SDGs are considered to have a direct impact on the day-to-day lives of the citizenry. Despite these limitations, the findings have valuable implications for both governments and regulatory bodies, to increase the implementation of policies and regulations that promote sustainable practices and the SDGs. It would be advisable for financial institutions in Ghana, to comply with regulations on sustainability in avoiding penalties and legal consequences. Also, this study will serve as an awareness for banks to invest in SDGs to align with regulatory expectations and demonstrate their commitment and adherence to sustainable banking practices. According to institutional theory, financial institutions must operate within a broader societal context and need to maintain external legitimacy to gain the trust and support of their stakeholders. By investing in SDGs, financial institutions, including banks, demonstrate their commitment to

this course, addressing social and environmental challenges, enhancing their external legitimacy and reputation, and ensuring long-term viability.

Ghanaian banking institutions have diverse stakeholders, including customers, investors, employees, and communities. These stakeholders increasingly expect banks to act responsibly and contribute positively to society. By meeting stakeholder expectations, banks can enhance trust, loyalty, and long-term relationships. According to institutional theory, when Ghanaian banks invest in SDGs, they can maintain external legitimacy, comply with regulations, meet stakeholder expectations, manage risks, and gain a competitive advantage. By aligning with the social and cultural norms of sustainability, the banking industry can contribute to positive societal and environmental outcomes while safeguarding its own long-term success and profitability. Additionally, collaboration between the regulator, Bank of Ghana, government, financial institutions, and development partners can help develop targeted interventions and programs that will increase access to finance for poverty reduction initiatives in Ghana. Addressing these financing barriers will require collaborative efforts from financial institutions, policymakers, and other stakeholders in promoting awareness, building capacity, creating an enabling regulatory environment, and providing innovative financing mechanisms tailored to the unique challenges faced by banks in Ghana and Africa as well.

This study provides a comprehensive analysis of how selected Sustainable Development Goals (SDGs) impact the profitability of Ghanaian banks. Using a mixed-method approach, the research identifies a strong positive correlation between SDGs 1, 3, 4, and 7 and bank profitability, illustrating the financial benefits of sustainable development initiatives. However, access to financing remains a significant barrier to fully realizing these benefits. The findings suggest that banks should continue to invest in sustainable practices, but policymakers and regulators must also create supportive frameworks to facilitate this transition. The study contributes to the literature by offering insights into the role of financial institutions in achieving the SDGs, particularly in developing countries.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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