Credit Risk Mediation in the Dynamics of Income Diversification and Sustainable Growth: Evidence from Banks in the West African Monetary Zone

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Abstract
Banks have played an important role in economic development in recent decades by forming capital, allocating credit, and facilitating financial transactions. However, their sustainability has been hampered by increased competition, technological advances, regulatory restrictions, and recurring financial crises, especially in emerging nations. Against this backdrop, this study investigates the impact of income diversification on the sustainable growth of banks in the West African Monetary Zone, with a particular emphasis on the mediating role of credit risk. The analysis uses structural equation modeling with bootstrapped mediation tests on an unbalanced panel of 20 publicly traded Nigerian and Ghanaian banks from 2015 to 2024. The findings show that bank income diversification has a beneficial and significant direct impact on banks' sustainable growth rates. However, credit risk partially balances this gain, resulting in a significant negative indirect effect and a negligible total effect. This pattern shows a suppression effect, emphasizing the dual nature of income diversification strategies in the WAMZ. The findings imply that income diversification can improve growth prospects provided there is adequate credit risk management. This study adds to the literature on bank stability and sustainable growth by explicitly modeling credit risk as a transmission channel.
Keywords: Income Diversification, Sustainable Growth, Credit Risk, West African Monetary Zone, Banking Sector

Introduction
In recent decades, the banking sector has grown to be an essential component of national economies owing to its substantial contributions to capital formation, credit allocation, and financial intermediation, which in turn promote economic growth and support the stability of financial systems (Kuanova et al., 2024). However, its ability to withstand regional and

global financial crises has been called into question, with its long-term viability being one of the main concerns. Ensuring sustainable growth in a rapidly evolving economic climate, marked by increased competition, technological disruption, and stricter regulations, is a crucial policy and strategic concern for banks, particularly in emerging countries. One strategic method that banks use to sustain growth is through income diversification, which involves extending revenue streams beyond traditional interest-based lending to include fees, commissions, trading income, and other non-interest-based sources (Rahman & Abbas, 2025).

While income diversification has the potential to reduce dependence on volatile interest income and enhance financial resilience, empirical evidence remains mixed. Some studies argue that diversification stabilizes earnings and promotes long-term growth (Najam et al., 2022; Xie et al., 2022), while others caution that relying too heavily on non-interest income introduces volatility and risk, undermining stability and long-term viability (Adesina, 2021; Taylor, 2022). This lack of consensus implies the presence of underlying mechanisms that govern how income diversification affects banks' sustainable growth. In this context, credit risk management is especially important, as lending remains the primary activity of banks in most emerging nations (Amoa-Gyarteng et al., 2025). According to Modern Portfolio theory and the buffer theory of loan loss provisions, bank income diversification can mitigate exposure to concentrated lending risks while loan loss provisioning practices enhance banks' resilience against potential loan defaults (Sultana & Jalloh, 2025). This viewpoint is particularly important for the West African Monetary Zone (WAMZ), where undeveloped capital markets, lax regulatory frameworks, and vulnerability to external shocks increase banks' exposure to credit risk. However, little empirical research has looked at whether credit risk, as proxied by the ratio of loan loss provisions to total loans, mediates the relationship between income diversification and sustainable growth, despite the importance of these issues. Addressing this gap is crucial for clarifying the conditions under which bank income diversification fosters resilience and long-term viability in the banking sectors of emerging economies.

This study addresses these gaps by examining the direct impact of bank income diversification on sustainable growth while also analyzing the mediating role of credit risk in this relationship. By doing so, we aim to provide empirical evidence that can inform banking practices and regulatory policies in WAMZ and similar emerging markets. The study adds to the body of literature in three ways by concentrating on a little-known regional context with distinct structural vulnerabilities. First, it makes clear how income diversification affects banking's long-term growth. Second, it expands the use of theories of credit risk, especially the buffer theory of loan loss provisions, in the context of emerging markets. Lastly, it gives bank managers and policymakers evidence-based insights on how to achieve sustainable growth while maintaining stability in financially precarious environments.

This study's significance goes beyond scholarly curiosity and has important real-world ramifications for numerous stakeholders. The study offers bank managers guidance on how to apply income diversification strategies in a way that promotes long-term growth while upholding efficient credit risk management. The results provide policymakers and regulators with information that can direct the creation of regulatory frameworks meant to improve financial stability and avert systemic banking crises. A better grasp of how income

diversification and credit risk interact to affect bank performance and financial sustainability can also be helpful to investors and financial analysts. Lastly, by offering empirical data from an understudied area, the study adds to the larger body of literature on banking stability and enhances international discussions about financial sustainability in emerging markets.

By examining the direct effect of income diversification on sustainable growth and exploring the mediating role of credit risk, this study aims to provide a more comprehensive understanding of the strategic and risk management factors that influence the long-term viability of banks in the WAMZ. In doing so, the research contributes to both theoretical development and practical policy formulation aimed at promoting resilient and sustainable banking systems. In the sections that follow, we will examine the relevant literature in detail, formulate hypotheses based on accepted theories and empirical data, outline our research methodology, present our findings, and talk about how they may affect banking and finance theory and practice. This methodical approach seeks to establish a strong basis for further research in this important field and offer significant insights to the current discussion on bank income diversification.

Literature Review and Hypothesis Development
Income Diversification and Sustainable Growth
Modern portfolio theory states that by distributing exposure and raising risk tolerance, bank income diversification lowers investment risk. According to researchers like Nisar et al. (2018) and Alouane et al. (2022), income diversification also lessens dependence on traditional interest-based revenue streams, which enhances earnings stability and risk management abilities. However, there are drawbacks to income diversification as well, including the loss of core banking competencies, the escalation of operational complexity, governance issues, and participation in less regulated, riskier activities like proprietary trading (Baselga-Pascual et al., 2018; Chowdhury et al., 2024; Ngoc Nguyen, 2019; Stiroh & Rumble, 2006).

Over the past 20 years, there has been a major change in the income patterns of banks in the WAMZ. One characteristic of this shift has been a growing reliance on non-interest revenue as a crucial source of income. Numerous macroeconomic, competitive, technological, and regulatory variables have altered the local banking environment and fueled the expansion of this source of income. How banks structure their revenue streams has become a more significant concern in WAMZ, where regulatory capacity, financial innovation, and institutional quality are still evolving. There are several implications of the increasing proportion of bank earnings in the WAMZ. On the plus side, it helps banks diversify their sources of income, reducing their reliance on interest income that is vulnerable to credit risk and monetary policy shocks. According to Saklain & Williams (2024), income diversification through non-interest activities can increase bank stability by spreading risk across multiple revenue streams. However, there are still concerns that if banks depend too much on unpredictable non-interest revenue streams like trading and foreign exchange gains, they may be vulnerable to market risks and earnings volatility.

Up until now, research has tended to ignore banks' long-term viability in favor of concentrating on how income diversification affects their profitability, risk, and efficiency (Addai et al., 2022; Adem, 2022; Chandramohan et al., 2022; Khan et al., 2020; Lahouel, Taleb, Kočišová, et al., 2022; Wang & Lin, 2021). Nevertheless, the impact of income diversification

on banks' sustainable growth is not examined in these studies. This research attempts to close this significant gap by proposing this hypothesis:

Hypothesis (H_1). Income diversification has a significant impact on the sustainable growth of banks in the West African Monetary Zone.

Income Diversification and Credit Risk

The relationship between income diversification strategies and credit risk outcomes is a significant concern given the growing number of non-performing loans (NPLs) and recurrent banking sector distress in the WAMZ, including the crises in Ghana in the 1980s, 1990s, and 2015, as well as in Nigeria in the mid-1990s and 2005 (Egbuna et al., 2021). The available data is still inconclusive; although non-interest revenue has increased profitability for certain banks, it has also been linked to increased credit losses and deteriorating asset quality for others (Mehmood & De Luca, 2023). Research from other emerging economies shows mixed results. Some studies, such as (Dang & Dang, 2021) and Nisar et al. (2018), associate diversification with lower credit risk, while others, including Beck et al. (2023) and Githaiga (2022), link it to more complex operations, governance issues, and increased risk-taking.

Theoretically, bank income diversification should lower concentration risk, according to portfolio theory, but opposing views contend that entering non-interest-based activities could raise operational and moral hazard risks. However, there is still a dearth of empirical research explicitly examining whether diversification reduces or increases credit risk in the WAMZ, even though non-interest revenue is becoming increasingly important to these banks. Given the undeveloped capital markets, lax regulations, and vulnerability to outside shocks that exacerbate credit risk vulnerabilities in WAMZ economies, this disparity is crucial. Accordingly, this study proposes the following hypothesis:

Hypothesis (H_2). income diversification significantly influences credit risk in the WAMZ banking sector.

Credit Risk and Sustainable Growth

The enormous challenges of an adverse macroeconomic climate, structural rigidities, insufficient supervision, and the absence of a credible policy environment are widely recognized as key drivers of banking crises in emerging nations (Kasyanenko et al., 2023). The dangers of concentrated income structures and weak risk management practices were underscored by repeated banking crises in the WAMZ over the past five decades, where NPLs consistently emerged as a central factor (Egbuna et al., 2021). NPLs immediately harm banks' ability to sustain expansion by eroding capital adequacy, reducing liquidity, and lowering profitability.

Sub-Saharan African banks historically exhibit higher NPL ratios than those in other regions. Persistent macroeconomic volatility, poor credit risk management, and the reluctance to write off aged, unresolved loans have contributed to average NPL ratios exceeding 10% since the mid-2010s (Eyraud et al., 2021). Two major waves of rising NPLs have characterized the region: the first in the 1990s, driven by fiscal imbalances and commodity price shocks, and the second following the global financial crisis, when many banks, including those in the WAMZ, shifted toward non-interest revenue sources to mitigate risk.

According to the financial intermediation theory, banks are essential in transferring money from units with surpluses to those with deficits, which promotes investment and economic expansion (Diamond, 1984). However, because lending is their primary business, this intermediate role exposes banks to credit risk. Excessive credit risk reduces profitability, limits lending capacity, and threatens financial stability, all of which make it harder for banks to continue growing. This is frequently seen in non-performing loans. Effective credit risk management, on the other hand, improves intermediation, allowing banks to keep funding profitable ventures and fostering long-term, sustainable growth.

Although prior studies in the WAMZ have examined different aspects of credit risk, such as its determinants, its effect on profitability, or its link to stability (Afolabi et al., 2020; Amoa-Gyarteng et al., 2025; Boye Dolo, 2021; Jackson & Tamuke, 2022;, there is limited research into its long-term implications for sustainable growth. From the perspective of the buffer theory of loan loss provisions, effective credit risk management enhances resilience by allowing banks to absorb shocks and maintain growth trajectories. This theoretical lens underscores the need to test the credit risk and sustainable growth nexus in the WAMZ, where structural vulnerabilities intensify risk exposure. Consequently, this study proposes the following hypothesis:
Hypothesis (H₃). Credit risk has a significant effect on the sustainable growth of banks in the WAMZ**.**

The Mediating Role of Credit Risk between Bank Income Diversification and Sustainable Growth
A natural byproduct of banks' conventional intermediation operations is credit risk (Qi et al., 2023). Credit risk can impact the relationship between income diversification and sustainable growth in several ways. Banks may be able to lower their exposure to credit risk and shift toward less risky revenue streams through income diversification. However, management's focus may be diverted by the pursuit of unconventional revenue streams, particularly riskier ones like trading or overseas operations, which could erode credit risk management frameworks and raise NPLs. Banks may respond to declining asset quality by employing reactive income diversification rather than proactive income diversification strategies in high-credit-risk environments, such as the WAMZ.

In this study, credit risk is operationalized as the ratio of loan loss provisions to total loans, which reflects banks' expected credit losses. This measure captures the extent to which banks anticipate and manage deteriorating asset quality, making it an appropriate mediation variable. According to the buffer theory of loan loss provisions (Laeven & Majnoni, 2003), provisions serve as a countercyclical cushion to absorb shocks and stabilize earnings. When banks diversify their income streams, they may be better positioned to accumulate and utilize such buffers, thereby enhancing resilience and supporting long-term growth. Conversely, if diversification leads banks into riskier income activities, provisioning may rise disproportionately, weakening the sustainability benefits of income diversification.

Previous studies have shown that credit risk has a considerable impact on bank performance and financial sustainability (Abdelaziz et al., 2022; Amoa-Gyarteng et al., 2025; De Leon, 2020; W. Jackson, 1995; Tan et al., 2017). However, most of this material focuses only on direct consequences. There is little empirical evidence that credit risk acts as a transmission channel

for income diversity and long-term growth. This disparity is especially noticeable in the WAMZ, where banks deal with ongoing NPLs, underdeveloped capital markets, and recurrent banking crises. The region is a crucial setting to test whether credit risk mediates the relationship between income diversification and sustainable growth rate because of these structural vulnerabilities.

Hypothesis (H_4). Credit risk mediates the relationship between bank income diversification and sustainable growth of banks in the WAMZ.

This study's proposed research framework, which incorporates these relationships, is depicted in Figure 1
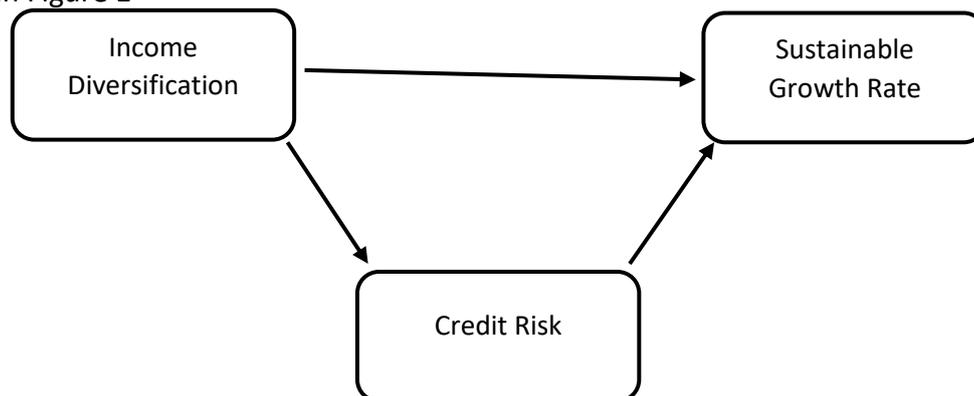

Figure 1. Research framework

Methods and Data

Data

The study's goal is to investigate how credit risk mediates the relationship between income diversification and sustainable Growth of banks in the WAMZ. The sample for this study comprises 206 observations that span the market share of 12 Nigerian and 8 Ghanaian banks listed on the Nigerian Exchange Group and the Ghanaian stock exchange, respectively, between 2015 and 2024. The audited annual reports of these banks are the source of financial data. The final dataset is an unbalanced panel due to missing observations for some banks in certain years.

The WAMZ consists of six countries: Nigeria, Ghana, Sierra Leone, The Gambia, Liberia, and Guinea. However, the study focuses on Nigeria and Ghana because (i) Liberia and The Gambia lack capital markets, and (ii) Sierra Leone and Guinea have very young capital markets with insufficient historical data for the study period. Furthermore, Nigerian and Ghanaian banks account for over 90% of WAMZ banking assets, making them representative of the region's financial system. While the sample provides strong coverage of the WAMZ banking sector, the exclusion of smaller economies (Sierra Leone, Guinea, Liberia, and The Gambia) limits the generalizability of results. Nonetheless, since Nigeria and Ghana dominate the region in both scale and influence, the findings remain highly relevant for understanding WAMZ banking dynamics.

Research Method

To achieve these goals, the authors employ a multidimensional analytical strategy that incorporates: (i) descriptive analysis to summarize patterns in bank income diversification,

credit risk, and sustainable growth, and (ii) structural equation modeling (SEM) to test the mediation pathway, following Baron and Kenny (1986) and Preacher and Hayes (2004). SEM is particularly appropriate for the sample size, as it allows for the simultaneous estimation of multiple relationships and provides bootstrapped confidence intervals that do not rely on the normality assumption. The baseline mediation framework is specified as:

$$SGR_{it} = \beta_0 + \beta_1 DIV_{it} + \beta_2 EQTA + \varepsilon_{it} \qquad \textbf{(1)}$$

$$LLPTL_{it} = \beta_0 + \beta_1 DIV_{it} + \varepsilon_{it} \qquad \textbf{(2)}$$

$$SGR_{it} = \beta_0 + \beta_1 LLPTL_{it} + \varepsilon_{it} \qquad \textbf{(3)}$$

$$SGR_{it} = \beta_0 + \beta_1 DIV_{it} + \beta_2 LLPTL_{it} + \beta_3 EQTA + \varepsilon_{it} \qquad \textbf{(4)}$$

β_0 is the intercept term.

β_1, β_2, and β_3 are coefficients of variables.

SGR represents Sustainable Growth Rate.

DIV represents Bank Income Diversification.

LLPTL represents Credit Risk.

EQTA represents Bank Capitalization

Definition of Variables and Measurement

Table 1

Definition of Variables

Variables	Abbreviation	Definition	Source
Dependent Variable			
Sustainable Growth	SGR	$SGR = ROE \times (1 - Dividend\ payout\ ratio)$	(Isnurhadi et al., 2023), (Vuković et al., 2022)
Independent Variables			
Income Diversification	DIV	The Ratio of Non-interest income to Total Income	(Alouane et al., 2022), (Adem, 2022)
Mediating Variable			
Credit Risk	LLPTL	The ratio of loan loss provision to total loans	(Lahouel et al., 2022), (Pham et al., 2021)
Control Variable			
Bank Capitalization	EQTA	The ratio of total equity to total assets	(Addai et al., 2022; Alouane et al., 2022)

Results and Discussion

The WAMZ banks' capitalization, liquidity, credit risk, income diversification, and SGR are summarized in Table 2. The average SGR reported by all banks is 15.3%, which indicates moderate growth, with figures ranging from 1.3 to 98 percent, indicating significant variations in banks' capacity to sustain development without relying on external funding. With a higher average SGR of 18.4% compared to Nigerian banks' 12.3%, Ghanaian banks perform better than Nigerian banks, according to disaggregated data. This implies that the expansion of Ghanaian banks is more robust and volatile, which could be brought about by better macroeconomic circumstances or more effective income diversification techniques.

The average diversification index (DIV) is 0.35, indicating considerable revenue diversification across banks. However, Nigerian banks demonstrate greater income diversification, with an average DIV of 46 percent compared to 23 percent for Ghanaian banks, suggesting that

Nigerian banks rely less on single revenue streams. Loan loss provisions relative to total loans (LLPTL) average 7.5 percent, showing that banks generally set aside a moderate share of loans to cover potential defaults. However, Nigerian banks provision only 4.3 percent of loans on average, while Ghanaian banks provision 11 percent. Ghanaian banks face higher loan default risks, forcing them to allocate more funds as provisions. Liquidity positions differ between the two countries: Nigerian banks have higher average liquidity buffers (59%) than Ghanaian banks (42 percent). Ghanaian banks, on the other hand, are more strongly capitalized, with an average equity-to-assets ratio of 16.1 percent compared to Nigerian banks' 11.9 percent, implying that Ghanaian banks rely more on equity funding, whilst Nigerian banks are more leveraged. When combined, these figures indicate that Ghanaian banks confront greater credit risk and reduced liquidity even as they strive for greater expansion and uphold better capital buffers. Nigerian banks, on the other hand, seem more liquid and diversified, but they develop more slowly and use more leverage.

Table 2

Descriptive Statistics

Variable	Obs	Mean	Std Dev	Min	Max
All Banks					
SGR	206	.1525438	.1045153	.0127292	.982228
DIV	206	.3503935	.2196938	-.0403547	.9112793
LLPTL	206	.0753876	.0769176	.0024896	.6490517
LIQ	206	.5042264	.2019562	.1442702	1.12631
EQTA	206	.1397558	.0520787	.0233184	.4492153
Nigerian Banks					
SGR	106	.1229541	.0699841	0191477	.3351407
DIV	106	.4615524	.2413348	.1058944	.9112793
LLPTL	106	.0431086	.0248363	.0024896	.1513292
LIQ	106	.5862901	.1618541	.2678152	.9915656
EQTA	106	.1193313	.0346845	.0572322	.2375345
Ghanian Banks					
SGR	100	.1839089	.1244728	.0127292	.982228
DIV	100	.2325651	.1044861	-.0403547	.6791891
LLPTL	100	.1096032	.0964293	.0047356	.6490517
LIQ	100	.4172388	.2044949	.1442702	1.12631
EQTA	100	.1614058	.0584818	.0233184	.4492153

Notes: This table presents descriptive statistics of the variables used in this article. SGR is a measure of sustainable growth, DIV measures bank income diversification, and LLPTL measures credit risk. Control variables: LIQ is the proxy for liquidity; EQTA is the measure of total capitalization.
Source: Authors' Computations

A bootstrapped SEM analysis (5,000 replications) found that DIV had a substantial positive direct effect on SGR (β = 0.066, p <.05) and a significant negative indirect effect via LLPTL (β = -0.058, p <.05). The total effect of DIV on SGR was not significant (β = 0.008, p =.781). This implies an uneven mediation pattern, with the mediator LLPTL somewhat suppressing DIV's direct favorable effect on SGR.

Our findings show inconsistent mediation, often known as a suppression effect, whereby diversification has a negative indirect effect through credit risk but a good direct effect on the sustainable growth of banks in the WAMZ. The result is a non-significant overall effect combined with a statistically significant indirect pathway. This trend is in line with modern mediation theory, which highlights that indirect effects can exist even in cases when total effects are not large (Chang et al., 2025; Hair et al., 2021). This is far from weakening the concept. The use of bootstrapped confidence intervals for identifying these effects is further supported by recent methodological work, which points out that depending solely on the importance of the overall effect may mask important mediational processes (Hayes, 2018). EQTA has no significant effect on SGR or LLPTL. This suggests that, within the WAMZ, mere capitalization levels may not directly translate into growth or reduced loan loss provisioning without effective risk management practices. Liquidity, on the other hand, has a significant negative relationship with LLPTL ($\beta = -0.145$, $p < 0.01$), implying that more liquid banks are better positioned to absorb shocks and therefore require fewer provisions.

Table 3
Direct, Indirect, and Total Effects of DIV on SGR (Bootstrapped, 5,000 replications)

Path	Observed Coefficient	P-Value	95% Bootstrap Confidence Interval	
			Lower	Upper
Direct Effect				
DIV → SGR	0.066	.029	0.007	0.125
LLPTL → SGR	0.688	.003	0.230	1.145
DIV → LLPTL	−0.084	.000	−0.113	−0.056
Indirect Effect				
DIV → LLPTL → SGR	−0.058	.013	−0.104	−0.012
Total Effect DIV → SGR (total)	0.008	.781	−0.047	0.062

Source: Authors' Computations

Discussion
The study's findings highlight the intricate relationships between bank income diversification, credit risk, and the sustainable growth of the WAMZ banking sector. These findings add to the continuing conversation in financial research by offering insightful information and being consistent with other recent studies. Firstly, the positive and significant direct effect of bank income diversification on sustainable growth implies that banks are better positioned to maintain growth over time if they have a wider variety of revenue sources, especially those that produce non-interest income like fees, commissions, and trading income. The result is in line with other research, such as Addai et al. (2022) and Adem (2022), showing that income diversification improves long-term profitability and stabilizes income. The modern portfolio theory offers the most compelling explanation for the favorable and notable direct impact of bank income diversification on sustainable growth. This idea, which was first put forth by Markowitz in 1952, states that diversifying sources of income lessens dependence on any one source of income, which in turn lowers the volatility of overall profits. The banking industry can soften cyclical volatility and preserve performance stability by moving away from only relying on interest income and toward non-interest income like fees, commissions, and

trading revenue. Banks are better positioned to maintain expansion over time by distributing risk across several revenue streams.

The study assesses the relationship between bank income diversification and credit risk, revealing a significant negative effect. This suggests that banks with larger revenue bases have lower provisioning needs since they are less reliant on risky lending practices. The outcome is consistent with earlier research demonstrating that income diversification can improve financial stability and lessen banks' vulnerability to loan losses (Abedifar et al., 2018). The financial intermediation theory provides the best explanation for the notable adverse impact of income diversification on credit risk. This theory holds that banks act as intermediaries that manage credit risks and information asymmetries while transferring money between savers and borrowers. Banks can lower their exposure to NPLs and loan loss provisioning needs by relying less on risky lending as their main source of income when their revenue base is larger. This suggests that income diversification improves banks' capacity to carry out their intermediation function since steady income from non-interest sources, including fees, commissions, and trading operations, protects against risks associated with loans.

Regarding credit risk impact on the sustainable growth of banks, this study finds that credit risk management favors the sustainable growth of banks in the WAMZ. This result aligns with the buffer theory of loan loss provisions, which contends that provisioning serves as a proactive tool to enhance shocks (Laeven & Majnoni, 2003). Banks can fortify their balance sheets and maintain long-term growth by anticipating losses. This result emphasizes that good credit risk management can actively support long-term growth rather than only being protective. Banks create buffers that improve balance sheet stability, maintain lending capacity, and protect long-term performance by putting up loan loss reserves ahead of time. By guaranteeing that banks can absorb losses without significantly impairing operations, loan loss provisioning helps to ensure sustainable growth. Thus, careful credit risk management serves as a strategic instrument for sustaining sustainable growth in the WAMZ scenario, where credit risks and macroeconomic instability are substantial.

Regarding the mediating role of credit risk between bank income diversification and the sustainable growth of WAMZ banks, the study's findings reveal that credit risk mediates the relationship between bank income diversification and sustainable growth. This study implies that, although income diversification may directly improve growth prospects, it also raises loan loss vulnerability, which partially negates these gains from a banking standpoint. The influence of income diversification on sustainable growth is mediated or even reversed by risk-related channels. Our results thus demonstrate the two-pronged character of income diversification in the WAMZ: while it may, under some circumstances, increase sustainable growth, it also brings stability risks that reduce these gains through increased loan-loss provisions. The risk–return trade-off theory, which holds that greater profits are typically linked to higher risk, provides the best explanation for these findings. Income diversification in this instance immediately raises banks' sustainable growth rates, but it also makes them more vulnerable to loan losses, which reduces or reverses the net benefits. The inherent trade-off between stability and growth in banking operations is reflected in this dual effect. The mediation results are consistent with agency theory as well, especially with regard to its risk-shifting viewpoint. Managers may take actions that unintentionally increase banks' risk

exposures while pursuing diversification initiatives to boost revenues or market share. Higher loan loss provisions are one indication that such managerial choices may result in agency costs that lower the long-term value of income diversification. Therefore, agency theory aids in explaining why income diversification strategies aren't always clearly advantageous from the perspective of stability or shareholders.

Conclusion
This study provides a nuanced understanding of the relationship between bank income diversification, credit risk, and a bank's sustainable growth by applying SEM to a dataset that includes Nigerian and Ghanaian banks from 2015 to 2024. Our results show that bank income diversification, as indicated by the ratio of non-interest income to total income, has a statistically significant beneficial impact on the sustainable growth rate of banks. The established theoretical idea that bank income diversification is essential to attaining long-term viability of banks in the WAMZ is supported by this actual data.

When the mediating effect is considered, the findings show that income diversification directly affects the sustainable growth of banks in the WAMZ in a favourable way. However, the indirect path from bank income diversification to sustainable growth becomes large and unfavorable when the mediating role of credit risk is considered. Based on this, diversification into non-interest revenue streams may directly improve sustainable growth, but it also increases exposure to credit risk, which reduces the total advantages. In particular, banks that generate revenue from sources other than traditional lending seem to have higher loan loss provisioning requirements, which is indicative of underlying asset quality problems.

When combined, the findings point to a paradox in diversification strategy: while it increases the possibility of bank sustainable growth, its efficacy depends on careful credit risk management. The negligible overall impact of income diversification on bank sustainable growth highlights the crucial mediating function of credit risk and emphasizes that bank income diversification cannot be viewed in a vacuum from the credit risk it creates. Future research could build on these findings by examining whether the mediating role of credit risk differs in various macroeconomic contexts, regulatory frameworks, and banking systems.

To sum up, this study makes a substantial addition to the corpus of information already available on banking in developing nations, particularly in sub-Saharan Africa. It offers a thorough framework for comprehending how income diversification strategies affect a bank's long-term viability by exposing the complex interactions among bank income diversification, credit risk, and sustainable growth. For the banking industry in WAMZ, these insights are especially helpful in guiding regulatory policies and strategic choices. From a policy standpoint, the findings emphasize the necessity of fostering sensible income diversification as a tool for both growth and risk management. Regulators should encourage forward-thinking loan loss provisioning techniques that increase resilience without reducing credit supply. In addition, keeping proper cash buffers is critical to reducing credit risk and improving overall financial stability. The wider theoretical ramifications, however, apply to comparable developing market environments and provide insightful guidance for negotiating the challenges of risk management and bank income diversification in the quest for long-term financial success.

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