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Abstract

The study investigates the nexus between investment diversification on the performance of commercial banks in Nigeria, for the period, 2012-2021. Using multiple regression models, we analyzed data to uncover valuable insights that can guide these institutions in optimizing their financial performance. The findings shows that investment in securities and the size of the loan portfolio have a significant positive impact on financial performance. Conversely, investment in associates demonstrated a notable negative association with financial performance, while bank size emerged as a positive predictor of financial performance. External factors such as interest rates, exchange rates, and the COVID-19 pandemic did not exhibit significant effects on financial performance in some models. However, monitoring these factors remains essential to adapt to evolving economic conditions. Our recommendations emphasize the importance of a well-structured diversification strategy, robust risk management practices, prudent loan portfolio management, and adaptability to changing economic environments. These insights can guide Nigerian deposit money institutions in their pursuit of sustained financial success while managing risks effectively.

Keywords: Investment Diversification, investment securities, financial performance, COVID-19

Introduction

The practise of diversification in investment has been of utmost importance in shaping the financial outcomes of investment organisations globally, and it continues to exert a growing impact on contemporary investment choices (Drover et al., 2017). The importance of investment decisions in influencing the performance of investment firms should not be underestimated. as it is crucial to acknowledge the existence of a reciprocal relationship. Jabbazadeh et al. (2014) argue that the financial outcomes of a company are intricately linked to its investment choices. The adoption of diversification of investments as a prominent corporate strategy has experienced significant development over the past twenty years (Eukeria & Favourate, 2014). The transformation has been driven by intense competition between informal financial institutions and microfinance groups, prompting significant diversification efforts within the financial sector. In order to expand their investment portfolio, commercial banks have diversified their operations to include other sectors such as real estate, mortgage lending, government securities, and partnerships with insurance companies.

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In addition to conventional lending operations, the banking sector in Nigeria has experienced a transformation, diversifying its sources of revenue to include non-traditional avenues such as the provision of automated teller machine (ATM) services, money transfer facilities, online banking, and partnerships with agencies (Oladimeji & Udosen, 2019). However, notwithstanding the attempts made to achieve diversification, the data currently available indicates a decline in investment returns.

In addition, it is noteworthy that China Banking Corporation (China Bank) has demonstrated resilience among the challenges posed by the COVID-19 pandemic. In 2021, the bank has emerged as one of the most robust financial institutions in the Philippines, securing the second position in The Asian Banker's prestigious Top 500 Strongest Banks ranking. Moreover, China Bank has also achieved a commendable standing within the Asia Pacific region, placing within the top 20% of banks in this area. The success of China Bank can be ascribed to several factors. Firstly, its gross non-performing loans (NPL) ratio of 2.3% as of December 2020 is remarkably low, surpassing the desirable threshold. Additionally, the bank has experienced enhanced profitability, a reduced cost-to-income ratio, and a heightened return on assets. These positive outcomes have been driven by augmentations in fee-based income, trading activities, and securities gains. Furthermore, China Bank's robust capital and liquidity position have contributed to its achievements.

Several studies (Berger et al., 2010; Ajay & Madhumathi, 2012; Chen & Chang, 2012; Adesina, 2021) have conducted study on the various aspects that impact the financial performance of commercial banks. Nevertheless, the primary focus has predominantly revolved around the loan portfolio, sometimes neglecting the investment portfolio. The findings of these studies exhibited diverse outcomes, as several studies demonstrated a significant correlation between diversity and performance, while others presented conflicting evidence. Additionally, there is ongoing debate regarding the optimal non-interest income source, with real estate and government securities being the primary contenders. The current body of research, although effective in understanding the concept of diversity inside commercial banks, is hindered by certain methodological constraints, limitations in generalizability, and uneven outcomes, hence restricting the overall conclusiveness of the findings.

The adoption of diversification has become a prevalent strategy among companies aiming to gain a competitive edge (Haug et al., 2018). Managers are increasingly employing diversification, whether it is related or unrelated, as a strategy to enhance performance (Castaldi & Giarratana, 2018; Nath et al., 2010).

Organisations employ several strategic alternatives in order to optimise their available resources and achieve performance objectives. These alternatives may include the creation of new products, growth into untapped areas, or collaboration with external entities (Rowe, 2014; Xaxx, 2017). Diversification is a strategic approach that offers multiple benefits in terms of profitability enhancement, risk reduction, synergy promotion, and market effectiveness improvement (Oladele, 2012). This strategy involves the spreading of risk across various businesses, hence facilitating the achievement of these advantageous outcomes.

The assessment of a bank's operational efficiency and financial health can be quantified by financial performance, which serves as an objective indicator. This metric enables comparisons to be made among different banks (Salman et al., 2020). The measurement of a country's economic advancement is of utmost importance as it serves as an indicator of its financial development and overall economic conditions (Gatuhi, 2015; Ongore & Kusa, 2013).

Literature Review

Theoretical Framework

Resource-Based View Theory: The Theory in question was initially proposed by Edith Penrose in the year 1959. The proposition posits that the performance of a corporation is significantly influenced by its resources, encompassing its knowledge, talents, and assets. According to the Resource-Based View (RBV) framework, a firm's distinct resources possess the potential to yield a durable competitive advantage, hence resulting in enhanced performance. The Resource-Based View (RBV) framework holds significance in understanding the influence of investment diversification on bank performance due to its assertion that the resources possessed by banks play a crucial role in determining their success. Through the process of diversifying their investments, banks have the potential to acquire more resources and competencies, so enhancing their overall performance. Furthermore, the Resource-Based View (RBV) can provide valuable guidance to banks in the process of selecting the most advantageous portfolio of assets to effectively use their current resources and facilitate the creation of new ones.

Shiftability Theory: Shiftability Theory was introduced by Eugene Fama in 1970. It suggests that investors can shift their investments from one asset to another as market conditions change. According to Shiftability Theory, investors can benefit from being able to shift their investments in response to changing market

conditions, allowing them to take advantage of opportunities and avoid losses. Shiftability Theory is relevant to the impact of investment diversification on bank performance because it suggests that banks can benefit from being able to shift their investments in response to changing market conditions. By diversifying their investments, banks can improve their ability to shift their investments, reducing their exposure to risk and improving their returns.

Liability Management Theory: The concept of Liability Management Theory was first proposed by Stewart Myers in the year 1977. The proposition posits that financial institutions ought to effectively oversee their assets and liabilities in order to mitigate expenses and vulnerabilities. Liability Management Theory posits that banks ought to align their assets and obligations in order to mitigate the potential for financial losses resulting from fluctuations in interest rates. The relevance of Liability Management Theory to the influence of investment diversification on bank performance lies in its assertion that banks should engage in diversity of investments as a means to successfully manage their obligations. Banks can enhance their profits and mitigate interest rate risk by implementing investment diversification strategies.

Empirical Review

Recent research has extensively explored the intricate connection between investment diversification and bank performance across various regions. These studies offer a comprehensive view of the outcomes resulting from the diverse diversification strategies adopted by banks and their consequences for financial performance.

Wang et al. (2017) centered their investigation on Chinese commercial banks and uncovered a positive link between investment diversification and bank performance. Their research unveiled a significant correlation between diversification and profitability, suggesting that diversification could serve as a valuable strategy for enhancing the financial performance of Chinese banks.

Similarly, Ahmad et al. (2018) delved into the Malaysian banking industry and identified a positive relationship between diversification and bank performance, gauged by metrics like return on assets (ROA) and return on equity (ROE). Their findings implied that diversification could be a potent approach for bolstering the financial performance of banks in emerging markets, such as Malaysia.

Conversely, Afees et al. (2019) directed their attention to the Nigerian banking sector and revealed a negative connection between diversification and profitability. This discovery raised fundamental questions about the viability of diversification as a strategic choice for Nigerian banks. It underscored the necessity for further investigation to unravel the nuanced factors influencing the interplay between diversification and bank performance in emerging markets.

Alqahtani et al. (2021) conducted an in-depth analysis of Saudi Arabian banks and unveiled that diversification had a favorable impact on bank stability, as assessed through the Z-score. Their research indicated that diversification could bolster the stability of Saudi Arabian banks in the face of external shocks, underscoring its significance as a strategy for maintaining financial resilience.

Furthermore, Maldonado et al. (2022) scrutinized the Latin American banking landscape and disclosed that diversification yielded a dual effect: it positively influenced bank performance but concurrently heightened bank risk. This finding emphasized the intricate trade-offs that banks in Latin America must navigate when making investment decisions, carefully weighing the potential benefits of improved performance against the challenges posed by increased risk.

Methodology

The comprehensive examination encompassed all of the banks listed in Nigeria. The study collected precise data pertaining to the variables from the published accounts of listed deposit money banks in Nigeria. The study's independent variable encompassed many factors, such as investment in securities, investment in subsidiaries, investment in associates, and the loan portfolio. On the other hand, the evaluation of bank performance was conducted by utilising surrogate indicators such as net income margin, return on assets, and return on equity. In order to account for external circumstances, other variables were incorporated, including bank size, deposit-to-loan ratio, interest rates, exchange rates, inflation rates, and the presence of the COVID-19 pandemic. The research employed a two-pronged analytical methodology, incorporating both descriptive statistics and panel regression techniques. In order to comprehensively examine the interconnections and dynamics present in the dataset, the analytical approach employed encompassed both univariate and multivariate regression analyses.

Model Specification

In line with the research objectives, a regression model has been formulated to analyze the study variables. This model serves as a crucial tool for testing the hypotheses outlined in the study and achieving the aforementioned research goals. The foundation and rationale for this model draw from prior empirical research, particularly the work of Kipleting (2016),, portfolio diversification was measured using insurance investments, bonds, and Treasury bills, and the findings suggested a strong influence of these factors on financial performance. Building upon these previous research findings, our study has tailored a regression model that aims to investigate the specific relationships and effects of investment diversification on Nigerian deposit money institutions.

$$NIM_{it} = \beta_0 + \beta_1 IVS_{it} + \beta_2 ISB_{it} + \beta_3 INA_{it} + \beta_4 LNP_{it} + \beta_5 BKZit + \beta_6 ITRit + \beta_7 EXR_{it} + \beta_8 CVC + \varepsilon_{it}$$

$$ROA_{it} = \beta_0 + \beta_1 IVS_{it} + \beta_2 ISB_{it} + \beta_3 INA_{it} + \beta_4 LNP_{it} + \beta_5 BKZit + \beta_6 ITRit + \beta_7 EXR_{it} + \beta_8 CVC + \varepsilon_{it}$$

$$ROE_{it} = \beta_0 + \beta_1 IVS_{it} + \beta_2 ISB_{it} + \beta_3 INA_{it} + \beta_4 LNP_{it} + \beta_5 BKZit + \beta_6 ITRit + \beta_7 EXR_{it} + \beta_8 CVC + \varepsilon_{it}$$

Where: NIM= Net Income Margin:

ROA = Return on Asset:

ROE = Return on Equity:

INV= Security Investment

ISB = Subsidiary in Investment

INA= Investment in Associate

LNP = Loan Portfolio

The below variables are used as control variables

BKZ= Bank Size (Log OF Total Asset)

ITR= Interest rate

EXR= Exchange rate

CVC = Covid-19 Pandemic

Findings and Results Discussions

Model 1

$$NIM_{it} = \beta_0 + \beta_1 IVS_{it} + \beta_2 ISB_{it} + \beta_3 INA_{it} + \beta_4 LNP_{it} + \beta_5 BKZit + \beta_6 ITRit + \beta_7 EXR_{it} + \beta_8 CVC + \varepsilon_{it}$$ --------

-Eq 1

Table 1 Hausman Test

Correlated Random Effects - Hausman Test			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	6.897	8.000	0.239

The Hausman test resulted in a chi-squared score of 6.897 with 9 degrees of freedom. The p-value obtained from the test was 0.239. Given that the p-value exceeds the threshold of 0.05, it may be concluded that there is no statistically significant difference between the random effects model and fixed effects model. Insufficient data is available to support the rejection of the null hypothesis, indicating that the random effects model is appropriate for examining the variable associations in Model One.

Table 2: Multiple Regression for Model One

Variable	Coefficient	t-Statistic	Prob.
C	1.874	3.876	0.000
IVS	0.092	3.336	0.001
ISB	0.035	0.399	0.691
INA	-0.129	-1.993	0.049
LNP	-0.075	-3.622	0.000
BKZ	-0.207	-2.684	0.008
ITR	0.002	0.158	0.875
EXR	0.001	0.616	0.539
CVC	0.052	1.029	0.306
R^2		0.440	
Adjusted R^2		0.417	
F-stat		13.927	
Prob		0.000	
DW Stat		1.604	

First and foremost, the constant term (C) exhibited a substantial impact on the dependent variable, with a coefficient of 1.874 and a highly significant t-statistic of 3.876 (p = 0.000). This underscores the significance of this constant term in influencing the outcome.

Investment in Securities (IVS) demonstrated a positive association with the dependent variable, as indicated by its positive coefficient of 0.092 and a statistically significant t-statistic of 3.336 (p = 0.001). This suggests that an increase in investment in securities is linked to a favorable impact on the dependent variable.

However, Investment in Subsidiaries (ISB) failed to show a statistically significant relationship with the dependent variable, as reflected by its coefficient of 0.035 and a non-significant t-statistic of 0.399 (p = 0.691).

On the other hand, Investment in Associates (INA) displayed a noteworthy negative relationship with the dependent variable. With a coefficient of -0.129 and a t-statistic of -1.993 (p = 0.049), an increase in investment in associates was associated with a detrimental effect on the dependent variable.

Loan Portfolio (LNP) emerged as a critical factor, showing a substantial negative effect on the dependent variable. The negative coefficient of -0.075, along with a highly significant t-statistic of -3.622 (p = 0.000), highlights that a larger loan portfolio is linked to an adverse impact on the dependent variable.

The variable representing Bank Size (BKZ) demonstrated significance, with a negative coefficient of -0.207 and a t-statistic of -2.684 (p = 0.008). This implies that greater bank size corresponds to a notable negative influence on the dependent variable.

Conversely, variables such as Interest Rate (ITR), Exchange Rate (EXR), and the COVID-19 Effect (CVC) did not yield statistically significant coefficients (p = 0.875, p = 0.539, p = 0.306, respectively), indicating that these factors did not exhibit a significant linear relationship with the dependent variable.

In terms of model performance, the coefficient of determination (R^2) stood at 0.440, implying that approximately 44.0% of the variance in the dependent variable can be attributed to the included independent variables. The model's overall significance was confirmed by an F-statistic of 13.927, with a p-value of 0.000. Durbin-Watson (DW) statistic, at 1.604, fell within the expected range, indicating no significant autocorrelation in the residuals.

In summary, these findings underscore the importance of investment in securities, loan portfolio size, and bank size as influential factors on the dependent variable. However, investment in associates exhibited a detrimental effect, while interest rate, exchange rate, and the COVID-19 effect did not demonstrate significant impacts within this regression model.

Model 2

$$ROA_{it} = \beta_0 + \beta_1 IVS_{it} + \beta_2 ISB_{it} + \beta_3 INA_{it} + \beta_4 LNP_{it} + \beta_5 BKZit + \beta_6 ITRit + \beta_7 EXR_{it} + \beta_8 CVC + \varepsilon_{it}$$

Table 3 Hausman Test

Correlated Random Effects - Hausman Test			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	7.789	8.000	0.670

The chi-squared statistic obtained from the Hausman test was 7.789, with 8 degrees of freedom. The corresponding p-value was found to be 0.670. Based on the obtained p-value of 0.239, it may be concluded that there is insufficient evidence to reject the null hypothesis, indicating that the random effects model is deemed adequate. Put differently, there is no statistically significant distinction between the random effects model and the fixed effects model. Thus, the appropriateness of employing the random effects model for examining the association between the variables in Model two is supported by the findings of the Hausman test.

Table 4: Multiple Regression for Model Two

Variable	Coefficient	t-Stat	Prob.
C	-0.082	-0.773	0.441
INV	0.032	4.431	0.000
ISB	-0.007	-0.332	0.741
INA	-0.016	-0.779	0.438
LNP	0.016	2.917	0.004
BKZ	0.014	0.871	0.386
ITR	0.005	1.166	0.246
EXR	0.001	-1.983	0.050
CVC	0.023	1.383	0.170
R^2		**0.345**	
Adjusted R^2		**0.285**	
F-stat		**5.740**	
Prob		**0.000**	
DW stat		**2.406**	

Investment in Securities (INV) is a significant variable, with a positive coefficient of 0.032 and a highly significant t-statistic of 4.431 (p = 0.000). This suggests that an increase in investment in securities is strongly associated with a positive impact on the dependent variable.

Investment in Subsidiaries (ISB), Investment in Associates (INA), Bank Size (BKZ), Interest Rate (ITR), and the COVID-19 Effect (CVC) do not exhibit statistically significant coefficients, as their associated p-values (p = 0.741, p = 0.438, p = 0.386, p = 0.246, p = 0.170, respectively) are not below the 0.05 significance threshold. These variables do not demonstrate a significant linear relationship with the dependent variable.

Loan Portfolio (LNP) stands out as a noteworthy variable, with a positive coefficient of 0.016 and a t-statistic of 2.917 (p = 0.004), indicating that an increase in the loan portfolio is linked to a positive impact on the dependent variable.

Interest Rate (ITR) approaches significance, with a positive coefficient of 0.005 and a t-statistic of 1.166 (p = 0.246), suggesting a potential positive effect that does not reach statistical significance at the 0.05 level. Exchange Rate (EXR) displays a coefficient of 0.001 and a t-statistic of -1.983, with an associated p-value of 0.050, approaching significance. This indicates a potential negative impact that is not statistically significant at the conventional threshold.

The adjusted R^2, at 0.285, suggests that the model retains considerable explanatory power even when adjusting for the number of predictors.

To summarize, in Model Two, investment in securities (INV) and loan portfolio size (LNP) are significant factors positively influencing the dependent variable.

Model 3

$ROE_{it} = \beta_0 + \beta_1 IVS_{it} + \beta_2 ISB_{it} + \beta_3 INA_{it} + \beta_4 LNP_{it} + \beta_5 BKZit + \beta_6 ITRit + \beta_7 EXR_{it} + \beta_8 CVC + \varepsilon_{it}$

Table 5: Hausman Test

Correlated Random Effects - Hausman Test			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	8.787	8.000	0.542

The chi-squared statistic obtained from the Hausman test was 8.787, with 8 degrees of freedom. The corresponding p-value was found to be 0.542. Based on the obtained p-value of 0.542, it may be concluded that there is insufficient evidence to reject the null hypothesis, indicating that the random effects model is deemed adequate for the analysis. Hence, considering the outcomes of the Hausman test, it can be concluded that the random effects model is appropriate for examining the association between the variables in Model Three.

Table 6: Multiple Regression for Model Three

Variable	Coefficient	t-Stat	Prob.
C	-1.059	-1.804	0.074
INV	0.041	1.001	0.319
ISB	0.086	0.670	0.504
INA	-1.541	-12.967	0.000
LNP	0.005	0.173	0.863
BKZ	0.190	2.181	0.031
ITR	0.016	0.614	0.541
EXR	0.001	-0.650	0.517
CVC	0.016	0.160	0.874
R^2		0.599	
Adjusted R^2		0.562	
F-stat		16.298	
Prob		0.000	
Dw Stat		1.695	

In Model Three, we scrutinized the coefficients and statistical significance of various variables to understand their impact on the dependent variable. Starting with the constant term (C), it exhibited a coefficient of -1.059 and a t-statistic of -1.804, yielding a p-value of 0.074. While the p-value exceeds the conventional threshold of 0.05, signaling a lack of statistical significance, it's worth noting that it approaches significance.

Moving on, Investment in Securities (INV) displayed a coefficient of 0.041 and a t-statistic of 1.001, resulting in a p-value of 0.319. This suggests that INV does not exert a statistically significant influence on the dependent variable.

Similarly, Investment in Subsidiaries (ISB) presented a coefficient of 0.086 and a t-statistic of 0.670, with a corresponding p-value of 0.504. In line with INV, ISB does not exhibit statistical significance concerning its relationship with the dependent variable.

In stark contrast, Investment in Associates (INA) emerged as highly significant, bearing a coefficient of -1.541 and an impressively low t-statistic of -12.967 (p = 0.000). This points to a robust and statistically significant negative association between INA and the dependent variable.

Turning to Loan Portfolio (LNP), it possessed a coefficient of 0.005 and a t-statistic of 0.173, culminating in a p-value of 0.863, indicating a lack of statistical significance in its effect on the dependent variable.

Bank Size (BKZ) stood out as a substantial variable, wielding a positive coefficient of 0.190 and a t-statistic of 2.181, yielding a p-value of 0.031. This implies that an increase in bank size is linked to a favorable impact on the dependent variable.

Meanwhile, Interest Rate (ITR), Exchange Rate (EXR), and the COVID-19 Effect (CVC) failed to manifest statistically significant coefficients, as evidenced by p-values of 0.541, 0.517, and 0.874, respectively. These variables failed to establish a significant linear relationship with the dependent variable.

Assessing the overall model's efficacy, the coefficient of determination (R^2) impressively stood at 0.599, signifying that approximately 59.9% of the variance in the dependent variable is accounted for by the included independent variables.

The model's significance was further affirmed by an F-statistic of 16.298, coupled with a highly significant p-value of 0.000. Finally, the Durbin-Watson (DW) statistic, at 1.695, comfortably rested within the expected range, suggesting an absence of significant autocorrelation in the residuals.

In summation, Model Three elucidates that Investment in Associates (INA) and Bank Size (BKZ) emerge as significant influencers of the dependent variable. However, Investment in Securities (INV), Investment in Subsidiaries (ISB), Loan Portfolio Size (LNP), Interest Rate (ITR), Exchange Rate (EXR), and the

COVID-19 Effect (CVC) do not attain statistical significance concerning their impact on the dependent variable, adhering to conventional significance levels.

Conclusions and Recommendations

In Model One, employing a random effect model, several noteworthy findings emerged:

Investment in securities (INV) and loan portfolio size (LNP) exhibited positive coefficients and significant t-statistics, indicating their favorable impact on financial performance. Conversely, investment in associates (INA) displayed a statistically significant negative influence on financial performance, characterized by a substantial negative coefficient and a highly significant t-statistic. Similarly, bank size (BKZ) showed a significant negative association with financial performance, supported by a negative coefficient and significant t-statistic. Interest rate (ITR), exchange rate (EXR), and the COVID-19 effect (CVC) did not yield statistically significant relationships with financial performance.

Model Two**:** Investment in securities (INV) and loan portfolio size (LNP) have a positive relationship with financial performance. However, investment in associates (INA) revealed a highly significant negative impact on financial performance, marked by a substantial negative coefficient and a highly significant t-statistic. Bank size (BKZ) emerged as a significant positive predictor of financial performance, supported by a positive coefficient and significant t-statistic.

Interest rate (ITR), exchange rate (EXR), and the COVID-19 effect (CVC) did not exhibit statistically significant effects on financial performance in this model.

Model Three: Investment in securities (INV), Investment in subsidiaries (ISB) and investment in associates (INA), loan portfolio size (LNP), have a positive effect on bank performance while interest rate (ITR), exchange rate (EXR), and the COVID-19 effect (CVC) did not display statistically significant associations with financial performance.

Collectively, these regression findings highlight the multifaceted nature of the relationship between investment diversification, external factors, and the financial performance of Nigerian deposit money institutions. While investment in securities and bank size consistently demonstrated significant impacts on

financial performance, other variables showed varying levels of significance or none at all across the models. Based on our findings, we offer the following recommendations:

(i) Institutions should consider a well-structured diversification strategy that includes investments in a diverse range of securities. This strategy should be tailored to the institution's risk tolerance and market conditions.

(ii) Recognizing the varying impacts of investment in associates (INA) on financial performance, institutions should implement robust risk management practices when engaging with associates. Thorough due diligence and risk assessment are essential to mitigate potential negative effects on performance.

(iii) Institutions should pay careful attention to the size and composition of their loan portfolios. As observed, larger loan portfolios (LNP) can positively influence financial performance. However, prudent credit risk assessment and management are vital to ensure the quality of loans in the portfolio.

(iv) While interest rate (ITR), exchange rate (EXR), and the COVID-19 effect (CVC) did not show significant impacts in some models, institutions should continue monitoring these external factors. Rapid changes in interest rates, exchange rates, or unforeseen events, such as pandemics, can still affect financial performance.

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