
ANALYSIS OF INTELLECTUAL CAPITAL AND FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN KENYA: AN APPLICATION OF VALUE ADDED INTELLECTUAL COEFFICIENT (VAIC™)

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ABSTRACT

Modern businesses are characterized by innovation, technological advancement, skills and knowledge management. Successful firms tend to be those that continually innovate, rely on new technologies and emphasize on skills and knowledge of their employees rather than physical assets such as plant or machinery to improve performance. Knowledge has become the new frontier in corporate management because value can be generated through intangible assets not often reflected in the financial statements. Firms should realize that this is an integral part in complete understanding of firm performance. The financial sector in Kenya today is highly competitive, with each player striving to create its own niche. Yet, to succeed in such an environment, creativity, innovation and skills management is imperative. Although these intangibles relate strictly with intellectual capital that is difficult to measure, they are critical in the successful management of modern corporate entities. It is apparent that most business enterprises still choose to invest more in physical assets rather than intangible assets to drive their profitability. This study investigated the impact of value added intellectual capital (VAIC™) on financial performance of listed commercial banks at the Nairobi securities exchange for the period 2010 to 2014. The study focused on capital employed efficiency, human capital efficiency and structural capital efficiency as predictor variables while the Net interest Margin was the response variable. Regression analysis was used. The findings showed that Capital employed efficiency had a significant effect on firm performance measured by net interest margin. Except for cooperative bank with HCE coefficient of 0.96, all other banks returned zero coefficients for HCE. Similarly, except for cooperative bank with SCE coefficient of Zero, all other banks returned a negative SCE coefficient. However, HCE coefficient was higher than SCE coefficient for all banks listed at the NSE. Capital employed efficiency (CEE) had the greatest impact of financial performance of commercial banks. Banks should recognize that human capital, and ultimately human capital efficiency is critical to realization of their corporate objectives. Financial institutions should adopt value added financial reporting so as to establish the impact of intellectual capital on their business. The ranking of the banks in terms of VAIC™ showed Standard chartered bank as the most efficient in utilizing its intellectual capital. Banks in Kenya should continue investing in their structural capital; information technology, databases and other satellite services such as agency banking, mobile phone banking and internet banking to improve their performance. The productivity of physical and financial assets of banks can be enhanced by investment in human capital efficiency.

Keywords: Intellectual capital, financial performance, innovation

1.0 Introduction

The world economies today are fast becoming knowledge-based economies through innovations and technological advancement. Knowledge has become the new frontier in corporate management because value can be generated through intangible assets not often reflected in the financial statements. Progressive and forward looking firms realize that this is an integral part of completely understanding the performance of their firms. Knowledge-based resources are the main source for businesses for catalyzing and sustaining competitive advantage in a dynamic business environment (Ting and Lean, 2009). Yet, to succeed in such an environment, creativity, innovation and skills management is imperative. Although these intangibles relate strictly with intellectual capital that is difficult to measure, they are critical in the successful management of modern corporate entities. It is apparent that most business enterprises still choose to invest more in physical assets rather than intangible assets to drive their profitability.

According to Pulic, (2008), knowledge production has been regarded as part of the value creation process for business and other organizations. This transformation has created a new perspective in viewing company resources. Low and Kalafut, (2002), defined intellectual capital as intangible assets which include technology, customer information, brand name, reputation and corporate culture that are invaluable to a firm's competitive power. Therefore, intellectual capital(IC) consists of; knowledge and innovativeness of the employees of the firm; the infrastructure of human capital (i.e. good working environment, systems and innovation) and improvement processes of structural capital and the external relationships of the firm. According to Bontis *et al.*, (2000) and Riahi-Belkaoui,(2003), these are the key drivers of organization performance and creation of future wealth. Yet, Lepak and Snell,(1999) posit that, in realizing the goals of a competitive, innovative, progressive and dynamic financial sector and the desire to achieve financial sector development and knowledge-based economy, greater efforts must be directed towards building human intellectual capital. Net interest margin is used as a proxy for financial performance. Net interest margin is the difference between the interest income earned by banks and interest paid out to lenders relative to the amount of assets.

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1.1 Statement of the problem

Today, companies do not primarily invest in fixed assets, but also in intangible assets that plays an important role in determining the value of a company. These intangible assets include knowledge and innovations by their employees. Although the current corporate performance measurement systems are heavily inclined towards financial and physical aspects of the company, it lacks relevant information regarding the performance of the intangible assets or intellectual capital efficiency. Which is why, these intangible assets are not reported in the financial statements yet it constitutes a critical component of business performance. Intellectual Capital is emerging as a key business component in the present world economies. Lack of understanding and appreciation of the intellectual capital leads to poor financial performance. Burgman et al (2005) has viewed intellectual capital, as an asset, represents all the stocks of what matters to the creation of enterprise value that is not represented on its traditional balance sheet as monetary or physical assets.

Therefore, knowledge on the impact of intellectual capital on the performance of listed commercial banks in Kenya is pertinent. The commercial banks post impressive results from their operations both in the interim period and full year performance. Therefore it is imperative to establish whether bank performance is tied to intellectual capital or the value of the intangible assets owned by the firm. The finding would be a basis for providing useful recommendations for policy development by the industry players.

1.2 Objective of the study

To determine the effect of intellectual capital on performance of commercial banks in Kenya

1.2.1 Specific Objectives

1. To evaluate the effect of structural capital efficiency on Net Interest Margin (NIM)
2. To examine the effect of capital employed efficiency on Net Interest Margin (NIM)
3. To determine the effect of human capital efficiency on Net Interest Margin (NIM)
4. To analyze the influence of intellectual capital efficiency on Net Interest Margin (NIM)
5. To investigate the effect of VAIC™ on Net Interest Margin (NIM)

1.3 Research Hypothesis

H₀₁: There is no relationship between Structural Capital Efficiency (SCE) and Net Interest Margin (NIM) of commercial banks in Kenya.

H₀₂: There is no relationship between Capital Employed Efficiency and Net Interest Margin (NIM) of commercial banks in Kenya.

H₀₃: There is no relationship between Human Capital Efficiency (HCE) and Net Interest Margin (NIM) of commercial banks in Kenya.

H₀₄: There is no relationship between Intellectual Capital Efficiency (ICE) and Net Interest Margin (NIM) of commercial banks in Kenya.

H₀₅: There is no relationship between VAIC™ and Net Interest Margin (NIM) of commercial banks in Kenya.

2.0 Literature Review

2.1 Intellectual Capital (IC)

Intellectual capital (IC) is the aggregation of knowledge within a company which generates competitive advantages (Stewart, 1997). Abdul and Fauziah (2007) described intellectual Capital (IC) as the aggregation of human knowledge, structural and relational resources. Further, Ting and Lean (2009) argued that intellectual capital is the result or the intellectual property generated from the process of knowledge transformation. According to Zéghal and Maaloul (2010), intellectual capital is the value added for the company, and it is the aggregation of knowledge which is used in the business value creation process. Edvinsson, (1999) argues that intellectual capital is a combination of mental acts, but not mere knowledge or pure intelligence; the discrepancy between company's market value and book value is explained as intellectual capital. Further, he opines that intellectual capital is "the experience, organizational technology, customer relationship management and professional skills that makes a company more competitive in the market".

Bontis (2004) claims that, intellectual capital refers to the organizational or individual knowledge that contributes to sustainable competitive advantage. Yet, Pulic (2004a) includes in his definition all employees' and organizations' ability to create value under a market assessment. According to Itami (1987), intellectual capital refers to intangible assets, including particular technologies, customer information, brand, reputation and corporate culture. These intangible assets are important measurements to a company's performance and competitiveness. Therefore, it is apparent that intellectual capital refers not only to the knowledge within an organization, but also the factors in creating value and competitive advantage for the business.

2.2 Components of intellectual capital

Intellectual capital can be broken into several components. Broadly speaking, intellectual capital can be classified into human and structural capital (Edvinsson, 1997; Edvinsson & Malone, 1997; Bontis, 2004; Chu, Chan & Wu, 2011). According to Roos & Roos, (1997), human capital “is in the heads of employees”, while structural capital is “what is left in the organization when people go home in the evening”. Ting and Lean (2009), identified human capital through innovation capacity, creativity, know-how and previous experience, teamwork capacity, employee flexibility, tolerance for ambiguity, motivation, satisfaction, learning capacity, loyalty, formal training and education.” Further, Bontis *et al.* (2000) identified structural capital through organizational databases, organizational charts, process manuals, strategies and routines. To this end, it follows that, properly and adequately managed intellectual capital is the key driving factor for sustainable corporate success (Yalama & Coskun, 2007; Ting & Lean, 2009; Chu, et al., 2011).

2.3 Review of past studies

A number of studies have been undertaken in the developed countries on the relationship between value added intellectual capital and firm performance. Bontis et al. (2000), argued that structural capital is positively associated with the performance of the company irrespective of the industry type. Firer and Williams (2003) found that physical capital influences the performance of companies in South Africa.

Nzuve and Musyoka, (2012) conducted a study to determine the relationship between human capital management practices and performance of Commercial Banks in Kenya. The study brings to the fore front, the need to appreciate the intellectual capital element as an important resource worth analyzing and hence determining its effect on the financial performance of any firm. The researchers used a cross sectional survey design as well as a correlation research. The study concluded that most commercial banks adopt human capital management practices to an average degree.

Pulic (2004b) studied the impact of intellectual capital on the banking sector. He measured Australian banks’ intellectual capital performance (1993 to 1995) and Croatian banks’ capital performance (1996 to 2000) using the VAIC™ model. The results showed that, performance rank and classic accounting rank gave banks significantly different ratings. In a study of service and non-service industries in Malaysia, Bontis (2004) identified three essential components of intellectual capital: human resource capital, capital structure and customer capital. The results showed that

capital structure has great influence on the performance of two sectors. Yet, although human resource is vital to both industries, it had a greater influence on service sector firms than on non-service sector firms. According to Kemboi et al (2014), intellectual capital has a significant and positive impact on employee performance. They concluded that firms should invest more in human capital through training and development.

Abbasi and Galdi Sedghi (2010), studied the impact of efficiency of each component of intellectual capital on the financial indicators of 99 firms listed on TSE over the period 2000-2003. The findings showed that the efficiency of each element of intellectual capital had a positive and significant effect on the return on equity. The results further showed that the efficiency of physical capital and human capital had a positive effect on earnings per share (EPS) while the effect of efficiency of the structural capital coefficient was negative. These results therefore implied that firms, which had a higher level of intellectual capital, preserved a better financial performance. Huang and Hsueh (2007), study on intellectual capital in consulting firms also signify intellectual capital to be the summation of all knowledge and capabilities of every employee that brings about performance and creates wealth for the enterprises. According to Zéghal and Maaloul (2010), intellectual capital had a positive impact on financial and economic performance of a firm. Mojtahedzade et al. (2010) studied the relationship between intellectual capital and its elements with the performance of the insurance firms. The findings showed that intellectual, human, customer, and structural capital had a significant relationship with firm performance.

Ahangar (2011) investigated one Iranian company in a period of thirty years. The results showed a major effect of intellectual capital on profitability and productivity of the firm. Further, Bin Ahmad and Mezeal Mushraf (2011) studied 320 Malaysian firms reported a positive relationship between intellectual capital and financial performance. Similarly, Murthy and Moritsen (2011), found that financial and physical capital had an effect on intellectual capital and also helped in improving the performance of firms.

Mojtahedzade et al. (2010), studied 3100 small and medium sized companies in Kenya. The results showed that there is a positive and significant relationship between intellectual capital and growth of these companies. Further, Ahuja and Ahuja (2012), on India's banking sector, found that there is

a positive effect of efficiency of intellectual capital on expected future performance of a firm. According to Shakina and Barajas (2012), in a study of 752 Russian and European firms over a period of 6 years, there is a positive relationship between the quality of intellectual capital efficiency and the financial performance of firms.

3.0 Methodology

3.1 Measurement of intellectual capital

Measurement of intellectual capital is difficult because it is an intangible asset. Yet, it provides the firm with the ability to realize its strategic goals, undertaking research and development by providing basic information (Paturel & Ferchichi, 2013). Intellectual capital can be measured based on both direct and indirect methods. Pulic (2004b) adopted an innovative intellectual capital measurement, Value Added Intellectual Capital (VAIC). There are however several other intellectual capital measurements methods that emerged around the same time. These include Tobin's Q Ratio and Direct Assessment Approach. This study adopts the VAIC approach. Value Added as an accounting approach is less utilized for reporting financial performance of firms. The value added strategy is critical for improved economic performance of commercial banks. Because of the highly advanced nature of operations of banking business, intellectual capital becomes an important driver of business performance. Recently, banks have embarked on providing value added services to their customers so as to sustain their growth prospects. The rationale for use of VAIC™ in the banking sector stems from the fact that banks are closely regulated by the central bank of Kenya and that the closeness of the nature of their services justifies the fact that its staff are more comparable intellectually than in other sectors (Kubo and Saka, 2002). Yet, the tight control and regulation of banking activities provides little room for competition and therefore, sustainable business success is guaranteed by increasing intellectual potential efficiency of the employees.

3.2 Justification for Using VAIC

The VAIC™ has been applied in many banking sectors around the world and each of these applications is proving the applicability, effectiveness, and credibility of VAIC™ in measuring IC efficiency. The model was applied in Japan (Mavridis, 2004), in Turkey (Yalama and Coskun, 2007), in Malaysia (Muhammad and Bharu, 2009), in Indian (Kamath, 2008) to mention just a few. The justifications for using VAIC™ in this study emanate from the results in the past on its applicability. Firstly, the model produces quantifiable, objective and quantitative measurements without the

requirement of any subjective grading. Secondly, this approach provides indicators that are relevant, useful and informative to all stakeholders, but not just shareholders, and with which they may also identify and compare the key components of Intellectual capital in order to assess firm performance. Thirdly, the model uses financial measures so that any indicators, relations or ratios computed may be used for comparison along with traditional financial indicators commonly found in business, which are based on monetary measures. Fourth, the model uses relatively simple and straightforward procedures in calculating the necessary indexes and coefficients, which may be simple to understand, especially for management and business people who are used to traditional accounting information. Fifth, the approach produces a form of standardized measurement. The indicators or indexes computed may be consistently applied to and used for comparison across divisional, company, industry and national level. In other words, benchmarking may therefore be possible. The VAIC model makes use of public or published financial data so that it may enhance the reliability of the measurement, and improve data availability. Further, it provides an intellectual capital measurement system that is consistent with the stakeholder view and resource-based view. The model treats human capital or employees as the most important source of skill, knowledge and innovativeness.

3.3 VAIC™ Model specification

Value added (VA) refers to the newly created value, calculated for an institution during a particular fiscal year. It is obtained as the difference between inputs and outputs of the operating activities of the firm.

$$VA = OUTPUT - INPUT \quad (1)$$

Where OUTPUT = total income from all products and services sold during the particular fiscal year. And INPUT = the total costs and expenses incurred by the firm during that particular fiscal year (excluding labor expenses, which are employees' compensation and all expenses that are related to their training and development. For purposes of this study, output is used to refer to the total revenue during a fiscal year for each bank, while input is the total costs and expenses excluding labor expenses, which are employees' compensations and all expenses that are related to their training and development. In this analysis, labor expenses are considered an investment and not cost.

Human Capital (HC) relates to the overall employees' compensation and all expenses that is related to their training and development. Structural Capital (SC) is the result of Human Capital's past

performance (organization, licenses, patents, image, standards, and relationship with customers), and it is calculated as:

$$SC = VA - HC \quad (2)$$

Where HC (Human Capital) = overall employees' compensations and all expenses that are related to their training and development. Human Capital Efficiency (HCE) is an indicator which shows how much VA is created on each monetary unit invested in HC.

$$HCE = VA/HC \quad (3)$$

Structural Capital Efficiency (SCE) is the indicator that shows the share of SC in value creation by a firm. It is the structural capital per unit of value added.

$$SCE = SC/VA \quad (4)$$

Intellectual Capital Efficiency (ICE) is the indicator that shows how efficiently IC has created value. It is obtained as the sum of human capital efficiency and structural capital efficiency.

$$ICE = HCE + SCE \quad (5)$$

Capital Employed Efficiency (CEE) is the indicator that shows how much VA is created on each monetary unit invested in CE. It is obtained as the ratio of value added per unit of capital employed.

$$CEE = VA/CE \quad (6)$$

Where CE (Capital Employed) refers to both Physical and Financial assets owned by the firm, the commercial banks in Kenya.

Finally, Value Added Intellectual Coefficient (VAIC™) indicates the value creation efficiency of all resources (sum of the previous indicators). It expresses the intellectual ability of a firm, a region or a national economy as a whole.

$$VAIC^{TM} = SCE + ICE + CEE \quad (7)$$

3.4 Data collection and Research Design

The data for this study was secondary data obtained from the published financial statements available on the websites of the top five listed commercial banks at the Nairobi Securities Exchange (NSE). The banks were selected based on their local ranking as shown by their asset base (CBK, Annual Report 2014). The study covered the period between 2010 and 2014. The financial statements were obtained from the central bank, sampled banks own website and African Financial's website. Content analysis technique was used to extract information from the financial statements. This research applied descriptive and empirical approach to test the relationship and correlation between intellectual capital and economic performance of commercial banks in Kenya.

Further, the Intellectual value added coefficient method is used to evaluate intellectual capital and to determine its efficiency.

3.4.1 Regression Variables

a) The Net Interest Margin (NIM)

The dependent variable for this study is the Net interest margin (NIM). With the banks performing the intermediation function, they issue liabilities and the proceeds received are used to purchase income earning assets. Therefore, with proper management of assets and liabilities, the bank should be able to earn substantial amount of income from its assets while incurring low costs on its liabilities. Yet, how well a bank manages its assets and liabilities is affected by the interest spread between the interest earned on bank assets and interest incurred on bank liabilities. The NIM is therefore an important measure of this spread. Hence, if the bank is able to raise funds from low interest cost liabilities and acquire assets with high interest income, the net interest margin will be high, and the bank is likely to be highly profitable. On the flip side, if the interest cost of liabilities rises relative to the interest earned on assets, the net interest margin will fall, and the bank's profitability will suffer.

b) The independent Variables

For this study, the independent variables are the Value Added Intellectual Coefficient (VAIC), Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE), Intellectual Capital Efficiency (ICE) and Capital Employed Efficiency (CEE).

3.4.2 Regression Model Specification

The regression model for this study is therefore specified as follows:

$$NIM = \alpha + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5 + \varepsilon \quad (8)$$

Where: NIM is the Net Interest Margin

$B_1 \dots B_5$ are the coefficients

X_1, X_2, X_3, X_4 and X_5 are the VAIC, HCE, SCE, ICE, and CEE respectively

ε is the error term

3.5 Results and test of hypothesis

From table 1, below we can observe that Standard Chartered bank is the best bank based on VAIC approach, while at the same time the bank is ranked fourth based on Asset value, switching positions with KCB. The key finding here is therefore that, in terms of efficiency of utilization of its resources and innovation, Standard Chartered bank is ahead of its peers as shown by the high value

of VAIC of 5.02 compared to KCB's 3.66. Similarly, cooperative bank, which is far much less profitable compared to KCB, has shown better utilization of its intangible resources and innovations in its operations. However, going forward, due to stiff competition in the sector, innovations and new product offerings continue to emerge.

Table 1: Bank Rankings Based on VAIC and Asset Value

Bank/Year	2010	2011	2012	2013	2014	Average VAIC	Rank	ASSETS
Standard Chartered Bank	4.8	4.78	5.2	5.23	5.09	5.02	1	4
Equity Bank Holdings Ltd	4.56	4.58	4.93	4.58	4.39	4.61	2	2
Cooperative Bank Ltd	3.68	3.44	4.39	4.16	4.44	4.02	3	3
KCB	3.14	3.63	3.71	3.78	4.04	3.66	4	1
Barclays Bank Kenya Ltd	-0.64	4	4.02	3.77	3.81	2.99	5	5

Source: Author Calculation, 2015

The above findings suggest that the largest bank by assets, profitability, Market Share and employees is not necessarily efficient. From the rankings, it's clear that KCB has been overtaken in terms of intellectual capital performance by other banks. These results are consistent with Goh (2005), on banks in Malaysia, who found that there is a significant difference between rankings of banks according to intellectual capital efficiency measured by VAIC™ and traditional performance measures represented by assets, net profit or shareholders' equity.

3.6 Regression results

The correlation and regression results of this study present interesting outcomes for different banks. All the independent variables for all the banks are positively correlated with the dependent variable except for KCB. This suggests that there is a strong relationship between intellectual capital and financial performance.

For Cooperative bank, (See Appendix), HCE and CEE have positive and significant effect on bank performance measured by NIM. A 1% increase in HCE and CEE results in a 0.96% and 0.38% increase in NIM respectively. However, ceteris Paribas, ICE will reduce NIM by 0.84% and SCE will have no effect. The combined effect of HCE and CEE is still significant.

For Equity bank, (See Appendix) ICE and CEE have positive and significant effect ($F=0.47$) on bank performance measured by NIM. A 1% increase in ICE and CEE results in a 0.5% and 3% increase in NIM respectively. However, ceteris Paribas, SCE will reduce NIM by 0.5% and HCE will have no effect. The combined effect of ICE and CEE (3.5%) is still significant leading to improved performance. The R Square of 0.58 means that 58% of performance is explained by HCE, SCE, ICE and CEE while 42% can be attributed to other factors eg Asset Quality, Employees Quality, Management efficiency, liquidity and Quality of Technology just to mention but a few.

According to the regression results for KCB bank (See Appendix), only CEE has positive and significant effect ($F=0.339$) on bank performance measured by NIM. A 1% increase in CEE results in a 0.64% increase in NIM. However, ceteris Paribas, SCE and ICE will reduce NIM by 0.02% and 0.01% respectively while HCE will have no effect, yet the combined effect of CEE (0.64%) is still significant meaning that capital employed efficiency influences performance.

Similarly, for Barclays bank,(See Appendix), CEE and ICE has positive and significant effect ($F=170.27$) on bank performance measured by NIM. A 1% increase in CEE and ICE results in a 0.2% and 0.05% increase in NIM respectively. However, ceteris Paribas, SCE will reduce NIM by 0.13% while HCE will have no effect. The combined effect of CEE and ICE(0.25%) is still significant hence intellectual capital efficiency influences performance.

Finally, for Standard Chartered bank,(See Appendix), CEE and ICE has positive and significant effect ($F=3.68$) on bank performance measured by NIM. A 1% increase in CEE and ICE results in a 0.22% and 0.32% increase in NIM respectively. However, ceteris Paribas, SCE will reduce NIM by 3.65% while HCE will have no effect. The combined effect of CEE and ICE (0.54%) meaning that intellectual capital efficiency influences performance. With R Square of 0.92, it means that 92% of its performance is explained by ICE and CEE while 8% can be attributed to other factors. This result confirms the ranking of the bank based on VAIC™. Therefore, the bank should continue investing in

innovation and knowledge of its employees and re-evaluate its investment in Structural capital and human capital to further improve efficiency.

3.7 Conclusion and Recommendations

For all the firms under study, CEE has a significant positive effect on performance. These maybe attributed to capital restrictions by the central bank (CBK). However, except for cooperative bank (HCE=0.96), HCE has no effect on performance of a Bank. Similarly, except for Cooperative Bank (SCE=0), all other banks have negative SCE. Apparently, Human Capital Efficiency is higher than Structural Capital efficiency for all banks under study, therefore Banks Should invest more in Human Capital Efficiency to improve performance. This result is consistent with Goh, (2005). Further, banks should continue to invest in information technology, databases and other satellite services eg Agency Banking, mobile phone banking, internet banking to improve performance. These services may constitute the future of banking in developing countries. The findings of this study intimate further that intellectual capital is critically important for the success of an organization and economic development due to its positive impact on economic performance. This finding is consistent with the findings of Zéghal and Maaloul (2010). Similarly, CEE had the greatest impact on economic performance of banks, an outcome that corroborates the results of Parvis et al, (2014). The findings of this study are also consistent with Yian and Shamsudin (2013). Thus following this findings and the hypotheses tested, we reject the first, second, fourth and fifth hypotheses and fail to reject the third hypothesis.

Following the findings of this study, banks in Kenya should enhance their capital employed efficiency by ensuring that capital is allocated to the most deserving sectors of the economy as this has bigger impact on overall bank performance. With respect to human capital efficiency, banks in Kenya should endeavor to recruit and employ competent professionals with great skills and competencies to motivate employees to give their best. Further, banks should improve investment in technology and training and development to spur performance.

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