

## Assessing Nature of Competition in Kenya's Banking Sector

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### ABSTRACT

*This paper assesses nature of competition in Kenya's banking sector through Panzar-Rosse model by determining the H-statistic value. The study period is 1994-2016, with interest expense to total revenue ratio as the dependent variable. The results indicates that unit prices for factor inputs; capital, labour and fund, total assets and GDP have positive effect on total revenue while change in number of ATMs and non-performing loans to total assets ratio has negative effect. H-statistic value 0.716 proves that banks in Kenya do operate under monopolistic conditions with positive price elasticities for factor inputs. The results of analysis upon replacement of dependent variable with return on assets found out non-existence of equilibrium condition for the banking sector in the long run. Therefore, the banking sector requires proper management of assets, implementation of technology and heightened measures in dealing with loan defaulters. Continuous research on banking competition is important due to changing techniques and strategies employed by banks towards improved banking performance and continued existence.*

**Keywords:** Competition, Banking Sector, Panzar-Rosse Model, Kenya

### INTRODUCTION

The Banking industry remains dominant and very competitive in various economies across the world (Guzal Bekmuradova, 2016). It is obvious the tremendous transformations witnessed in financial institutions are gearing towards gaining competitive advantage against competitors as well remaining relevant in the market (J. Wonglimpiyarat, 2014).

Globalization, technological changes and growth in science has pushed for major transformations in the finance service industry. Banks' competitive advantage do define strengths of individual banks in a competitive environment depending on what banks do and how they actually position themselves in the market (Awuah Lawrence, 2011).

The banking sector of Kenya has been experiencing major reforms since independence. Some of the reforms include changes in the banking structure, collapsing and restructuring of banks that faced liquidity problems, mergers of banks and conversion on non-banking institutions to banking institutions. The Growth in the banking sector supports efforts by Government of Kenya for a vibrant and globally competitive banking sector through economic blue print; Vision 2030

(Central Bank of Kenya, 2016).

Banks tend to work tirelessly with an aim of growing their market shares, expand on asset base, increase in annual profits, minimize costs, and outdoing its competitors (Oji-Okoro Izuchukwu et al., 2014; J. Maudos, 2017). Therefore, competition in the banking sector remains a major practice existing in any given economy and it can be in form of service or products offered by banks to customers. Competitive advantage gives a firm control over its rivals and enables a firm to create a better value for itself and its shareholders.

In analyzing nature of competition in the banking sector, various researchers have employed Panzar-Rosse (PR) model (Metin Mercan, 2012; M. Tahir et al., 2016; M. D. Delis, 2010; T. Mulyaningsih et al., 2015). Other researchers employed regression models (Dana Kiseřáková et al., 2013; Oji-Okoro Izuchukwu et al., 2014; M'kuma Ezekiel Kimani, (2015). Guzal Bekmuradova (2016) and Mnjala Dorothy Mghoi (2014) opted to bring out the Theoretical and methodical to bring out the competition aspect in the banking sector. Awuah Lawrence (2011) conducted a descriptive statistics on Ghana Commercial Bank, no model employed.

However, findings by the above researchers is not conclusive in assessing nature of competition in the banking industry due to varying proxies for factor inputs, other variables and difference in periods under study. For instance, Guzal Bekmuradova (2016) and methodical approach failed to specify specific indicators and models to measure nature of competition in the banking sector through bank effectiveness and service innovation. Meanwhile, J. Wonglimpiyarat (2014) and M'kuma Ezekiel Kimani (2015) study on major commercial banks in Thailand and private sector in Kenya respectively was limited to competitive conditions surrounding large banks, strategic collaborations and strategic position towards sound competition in the banking industry. Oji-Okoro Izuchukwu et al. (2014) study was limited to employee aspect. Dana Kiseľáková et al. (2013) regression model was a disadvantage due to its inability to capture the non-linear dependence between variables. Some findings faced challenges; multi-collinearity, heterogeneity, omission on crucial indicators and limitation of study period due data unavailability (M. D. Delis, 2010; M. Tahir et al., 2016).

The purpose of this paper is to contribute to existing literature by employing various indicators and financial ratios in efforts to conduct a comprehensive analysis in determining nature of competition in the banking sector. In Kenya, most literature review conducted is mainly on competitive strategies limited scope of individual or specific class commercial banks (M'kuma Ezekiel Kimani, 2015; Dorothy Mghoi Mnjala) and the research work is either limited to theoretical aspect with limited sample of individual commercial banks. The uniqueness of this study in aspect to Kenya is that it looks at the entire commercial banks sector unlike previous studies whose studies are limited to a certain class of commercial banks; individual or those listed in the Nairobi Stock Exchange (NSE) or those under the private sector. Further, the study also sought to derive H-statistic value through P-R model development and conducting of equilibrium test for banking market in Kenya.

The paper comprises various sections as outlined. Sector 2 provides brief history about evolution of the Kenya banking sector and literature review on nature of competition in the banking sector through existing literature and empirical reviews. Sector 3 provides a

brief summary of the methodology used to assess nature of competition in banking sector in Kenya by considering factor inputs, bank specific variables and macro-economic variables. Section 4 presents study findings and section 5 provides summary of findings and draws conclusion based on study findings.

### EVOLUTION OF BANKING SECTOR IN KENYA

Undivided attention towards reforms in banking sector in Kenya has been existing for decades since the country acquired independence in 1963. This is because the finance industry which is most dominated by commercial banking sector do contribute to country's economy through financial intermediation roles and provision of employment opportunities (M'kuma Ezekiel Kimani, 2015). The banking market is segregated into three peer groups: large, medium and small banks. Large banks dominate the banking market with a market share index of more than 5% Majority of assets, deposits, shareholders' funds, deposit accounts and loan accounts for large banks are more than 50% of the totals by all banks (CBK, 2016).

Banking reforms has existed in other economies like Nigeria (Oji-Okoro Izuchukwu et al., 2014), Ghana (Awuah Lawrence, 2011) Indonesia (T. Mulyaningsih et al., 2015), United States (Metin Mercan, 2012) and Slovakia (Dana Kiseľáková et al., 2013). Such reforms affected all economies across the world for both developed and developing economies.

Before early 1990s financial crisis, Kenya's banking sector was already facing turbulence due to imprudent lending practices, which led to closure of many indigenous banks. To instill discipline in the banking sector, Kenya laws comprises Banking Act, which provides constant reminder on do's and don'ts by banks and provides bank stability in efforts to maximize financial system impact on economic growth. According to the Central Bank of Kenya (CBK) (2016), in order to keep pace with globalization and worldwide bank developments, a number of commercial banks embarked on modernization programmes, new financial products designed to improve on banking sector's sound competition through observing bank efficiency. In 1990s, majority of bank branches owned by large banks (CBK, 1994) closed in

rural areas and new ones opened in urban and highly populated areas. There was uneven distribution of branch networks due to low level of economic activities across regions. However, the trend changed in 2000s as more branches again opened up across regions in efforts to enable easy access of services and products by customers without traversing across regions.

As the banking sector became competitive each day, commercial banks opted to embrace technology to enable increased operational efficiency and reduced operational costs (Mnjala Dorothy Mghoi, 2014). Automated Teller Machines (ATMs) is one such bank services, which has been in existence since late 1980s and they provided alternative means of getting services and products which can be found in physical banking halls. The growing number of ATMs has had an upward trend in growth in number of ATMs for year 1994 to 2015. According to reports by CBK, several amendments to the initial 1968 Banking Act continues to strengthen the supervisory function and provide easy reference by banks to foster stability, efficiency and easy access to financial intermediation services.

### EMPIRICAL STUDIES ON NATURE OF COMPETITION IN THE BANKING SECTOR

Various studies have been conducted to measure the degree of competition in the banking sector through Panzar-Rosse model (M. D. Delis, 2010; Jacob Bikker et al., 2009; Metin Mercan, 2012; M. Tahir et al., 2016; T. Mulyaningsih et al., 2015). Jacob Bikker et al. (2009) research findings shows that P-R model do not offer conclusive results about competition nature of a market. This contradicts M. D. Delis (2010), Metin Mercan (2012), M. Tahir et al. (2016) and T. Mulyaningsih et al. (2015) acknowledgement of P-R model. P-R model provides direct measure of nature of competition, equilibrium condition and facilitates use of bank level data for analysis hence, most widely adopted model (T. Mulyaningsih et al., 2015). Several studies suggest different H-statistic values under different period of study for various countries. Banking market systems provide varied powers various banks depending on geographical locations, market concentration, rules and regulations dictating entries and exits across countries (K.J. Mitchener, D.C. Wheelock, 2013; T. Mulyaningsih et al 2015).

Different banking systems contribute to

importance of the financial system of any given economy and degree of competition varies according to level of capital requirements, foreign participation, type of ownership (T. Mulyaningsih et al, 2015). Banking market concentration in special locations; central business districts, industrial locations and highly populated places (K.J. Mitchener, D.C. Wheelock, 2013; O.A. Aluko, M.A. Ajayi, 2017) tend to increase banking competition. However, increased in banking competition also seems to have negative impact on banking development leading to formulation of more policies (M. Amidu, S. Wolfe, 2013) to eliminate unhealthy competition.

Banks have adopted latest information and communication technologies (M'kuma Ezekiel Kimani 2015) in efforts to improve on operation and cost efficiency. Mobile technology (J. Wonglimpiyarat, 2014) has led to introduction of mobile money, which improved customer interaction with the bank. Other modern technologies; electronic banking, internet banking, agency banking are implemented in efforts to reduce banking costs, increase customer base as well bringing services closer to people.

Bank management capability to generate more revenue from bank assets is another aspect to consider in ensuring banks maximizes profits (A. Dietrich, G. Wanzenried, 2014; J. Maudos, 2017). Loans form major asset base for most banks hence, giving banks greater financial intermediation importance than other financial intermediaries (J. Maudos, 2017). Therefore, diversification of loan products provides banks with a wider array of bank assets both in the short term and in the long term. Dana Kiseľáková et al. (2013) findings confirm a positive trend analysis for bank credit for banks in Slovakia. Therefore, proper management loans require banks to put more emphasis on how to deal with non-performing loans, which tend to have a negative impact on banks' total revenue (M. Tahir et al., 2016). Increased competition also may render existing lending policies ineffective (M. Amidu, S. Wolfe, 2013) hence negative impact on overall performance.

Many researchers have employed total assets determinant as a proxy for bank size (M. Tahir et al., 2016; J. Maudos, 2017), increase in bank assets (Dana Kiseľáková et al., 2013) increases bank returns. Management of bank assets and bank capital (Guzal Bekmuradova, 2016)

becomes task of every bank failure to which there will be inefficiency in financial intermediation operations and poor resource allocation (Murat Kasımoğlu et al., 2016). Bank size tend to form another classification for banks; large, medium and small (M. Pawlowska, 2016) and large banks dominate the banking market.

Employees in the banking industry need to be motivated as well being equipped with skills and knowledge on how to handle customers better than competitors (Oji-Okoro Izuchukwu et al., 2014). M'kuma Ezekiel Kimani (2015) emphasized on need by bank managers to support innovation, embrace latest technologies and closely working with other bank employees. Ability by individual banks to compete is also highly contributed by employee perception towards change on infrastructure and technologies by banks (J. Wonglimpiyarat, 2014). Employees forms key component of banks' resources (O.A. Aluko and M.A. Ajayi, 2017; Oji-Okoro Izuchukwu et al., 2014) as they handle day-to-day bank operations hence they also contribute to bank performance.

Banks incur interest expense on total deposits (A. Dietrich, G. Wanzenried, 2014). Interest expense dictates price elasticity variation in generation of bank revenue (Metin Mercan, 2012; M. Tahir et al., 2016). Cost leadership strategies employed banks need to take care of capital and other operational; expenses to ensure banks acquire improved overall returns. Customer satisfaction in terms of costs associated with products and services rendered by banks (Mnjala Dorothy Mghoi, 2014).

Large banks tend to woe more customers compared to small and medium banks through unique pricing (A. A. Michis, 2016) of bank products especially loans hence increased monopoly powers in the banking market.

In conclusion, banks do generate revenue under monopolistic competition conditions where by each bank tend to offer services and products that are different from other banks. Competition among banks is based on market structures and internal conducts; which largely depend on quality of operations, employee motivation, customer relations, uniqueness in pricing, differentiated products, implementation of technology and well managed costs. Efficient management of factor inputs, capital, labour

and fund, is key due to variation of price elasticities across banks due to different focus and strategies employed. Factors specific to banks cannot be ignored either, total assets, non-performing loans, macro-economic factors, technology as they also contribute to overall bank returns. Through competition, banks also tend to word tirelessly in ensuring they outdo each other in terms of performance, which in return leads to positive impact on financial stability and economic growth.

### ECONOMETRIC MODELING

Various researchers across the world have adopted the Panzar-Rosse (P-R) model (Panzar J., Rosse J., 1987) to assess nature of competition in the banking sector. The H-statistic is derived from bank's reduced-form revenue equation. Annual secondary data from commercial banks in Kenya, Central Bank of Kenya for the years between 1994 and 2016 will be sources of data for this study.

This study estimated P-R reduced revenue-form equation takes logarithm of total revenue as the dependent variable, which is used to measure competition in Kenya's banking sector. Factor inputs; labour, capital and fund, bank specific and macro-economic variables are the independent variables. By assuming an x-input and single output production function, the reduced-form equation of the P-R model in written as

$$\text{LogTR} = \beta^0 + \sum_{x=1}^x \beta_x \text{LogP}_x + \sum_{u=1}^u \alpha_u \text{LogQ}_u + \sum_{i=1}^i \gamma_i \text{LogR}_i + \varepsilon \quad (1)$$

Where: TR= Total Revenue, P<sub>x</sub> the x-th input factors, Q<sub>u</sub> the u-th bank's specific variables, and R<sub>i</sub> the i-th macro-economic variable(s).

Log is the natural logarithm and ε is the random standard error of observation. Panzar J. and Rosse J. (1987) H-statistic (H) value is derived from the sum price elasticities of factor input prices.

From Equation 2 below, β<sub>x</sub> denotes unknown input price elasticities, which forms H value.

$$H = \sum_{x=1}^x \beta_x \quad (2)$$

$$\text{LogTRTA} = \beta_0 + \sum_{x=1}^x \beta_x \text{LogP}_x + \sum_{u=1}^u \alpha_u \text{LogQ}_u + \sum_{i=1}^i \gamma_i \text{LogR}_i + \varepsilon \quad (3)$$

$$\text{LogTRTA} = \beta_0 + \beta_1 \text{LogP}_1 + \beta_2 \text{LogP}_2 + \beta_3 \text{LogP}_3 + \alpha_1 \text{LogQ}_1 + \alpha_2 \text{LogQ}_2 + \alpha_3 \text{LogQ}_3 + \gamma_1 \text{LogR}_1 + \varepsilon \quad (4)$$

The study further takes form of natural logarithm of total revenue divided by total assets. Therefore, equation 3 takes into consideration introduction of total assets into the reduced-form revenue equation 1.

Equation 4 breaks equation 3 into various input factors, bank's specific variables and macro-economic variable. Where P1, P2 and P3 denotes input factors with  $\beta_x$ -th unknown coefficients, Q1, Q2 and Q3 denotes bank's specific variable with  $X_u$ -th unknown coefficients and R1 denotes macro-economic variable with  $Y_1$  unknown coefficient. Since equations; 1, 3 and 4 presents unknown variables. The study further introduces reduce-form revenue equation with known variables as shown in equation 5.

$$\begin{aligned} \text{LogTRTA} = & \beta^0 + \beta^1 \text{LogIETD} + \\ & \beta^2 \text{LogEETA} + \beta^3 \text{LogDEFA} + X^1 \text{logNPLTL} + \\ & X^2 \text{logTA} + X^3 \text{logCATM} + Y_1 \text{LogGDP} + \varepsilon \end{aligned} \quad (5)$$

Where:

*Log* is the natural logarithm

*TRTA* is the ratio of total revenue to total assets

$\beta^0$  is the coefficient constant

*IETD* is ratio of total interest expense to total deposits,

*EETA* is the ratio of total employee expense to total assets

*DEFA* is the ratio of depreciation and other operating expenses to total fixed assets

*NPLTL* is the ratio of total non-performing loans to total loans

*TA* is the total assets

*CATM* is the annual change in number of Automated Teller Machines (ATMs)

*GDP* is the annual Gross Domestic Product (GDP) growth

$\varepsilon$  is the random standard error of observation.

IETD, EETA, DEFA are vectors for factor input prices for commercial banks in Kenya. IETD is a measure for unit price of funds, EETA is a measure for unit price of labour and DEFA is a measure for unit price of capital. NPLTL, TA and CATM are banks' other specific variables that take into consideration risks encountered, bank size and operational efficiency occasioned by commercial banks in Kenya. GDP is a macro-economic variable that affect the overall banking sector market in Kenya.

Factor input prices and other specific variables with total assets as the proxy variable for bank

size. The independent factors are considered to have effect on long-run equilibrium revenues for commercial banks in Kenya.

The reduce revenue-form equation 5 is then employed to calculate P-R H statistic, H is the sum of input price elasticities with respect to total revenue. (Jacob Bikker et al., 2009; Metin Mercan, 2012).

In this case,  $H = \beta_1 + \beta_2 + \beta_3$ ; where  $\beta_1 - \beta_3$  is input price elasticities. H-Statistic do represent the competitive structure of the market and it reveals information about the market or industry in which commercial banks in Kenya operate.

Further, to test the equilibrium nature of the banking market and bank performance in the long run, LOG TRTA is replaced with Natural logarithm of return on assets (Log ROA). To determine E-statistic, the equilibrium test model will be as indicated in equation 6, which also represents the banking performance model. Equation 7 represents sum of elasticity of returns; E-statistic value with respect to input price elasticities in equation 6.

$$\begin{aligned} \text{LogROA} = & \beta_0 + \beta_1 \text{LogIETD} + \beta_2 \text{LogEETA} + \\ & \beta_3 \text{LogDEFA} + X_1 \text{logNPLTL} + X_2 \text{logTA} + \\ & X_3 \text{logCATM} + Y_1 \text{LogGDP} + \varepsilon \end{aligned} \quad (6)$$

$$E = \sum_{x=1}^x \beta_x \quad (7)$$

Table 1 presents a summary of H- Statistic and E-Statistic value interpretation. Ordinary Least Square Method is adopted in this study in establishing coefficients for independent variables.

## RESULTS AND DISCUSSIONS

### State of Equilibrium and Performance of the Banking Sector

The study test to establish whether the banking sector is equilibrium or disequilibrium in nature in the long run gives equilibrium value (E) of -0.027. This indicates that there exist no equilibrium in Kenya's banking market for years between 1994 and 2016. With Log ROA as the dependent variable, regressed coefficients for IETD, EETA AND DEFA were 0.35, -0.86 and 0.48 respectively with sum of -0.027.

IETD, DEFA, TA, CATM, GDP have positive impact on ROA while EETA and NPLTL has negative impact on ROA. For instance, increase in unit of labour leads to decrease in ROA by 0.86. This indicates that price of

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labour in the long run affects bank's returns negatively with increase in unit price of labour

causing a massive reduction in bank returns by 0.86.

**Table1.** *H-Statistic value Interpretation*

Equilibrium Test	
1 <sup>st</sup> Condition E=0	Equilibrium.
2 <sup>nd</sup> Condition E<0	Disequilibrium or non-existence of equilibrium
Competitive Conditions	
1 <sup>st</sup> Condition H≤0	Conjectural variations oligopolistic or short run competition, collusive oligopolistic competition.
2 <sup>nd</sup> Condition H=1	Perfect competition or natural monopoly in a perfectly contestable market or profit maximization firm subject to break-even limitation.
3 <sup>rd</sup> Condition 0<H<1	Monopolistic Competition.

**Table2.** *Estimates of Equilibrium with Log ROA as the Dependent Variable*

Variable	Coeff	Std. Error	t-Stat	Prob.
C	10.23	6.69	1.53	0.15
LOGIETD	0.35	0.24	1.44	0.17
LOGEETA	-0.86	1.10	-2.60	0.02
LOGDEFA	0.48	0.45	1.09	0.29
LOGNPLTL	-0.61	0.32	-1.88	0.08
LOGTA	0.51	0.37	-1.37	0.19
LOGCATM	0.15	0.19	0.82	0.42
LOGGDP	0.15	0.12	1.26	0.23
R-squared	0.73	Mean dependent var		1.04
Adjusted R-squared	0.60	S.D. dependent var		0.64
S.E. of regression	0.40	Akaike info criterion		1.28
Sum squared resid	2.42	Schwarz criterion		1.68
Log likelihood	-6.73	Hannan-Quinn criter.		1.38
F-statistic	5.74	Durbin-Watson stat		1.77
Prob (F-stat)	0.002			
E	-0.027			

Increase in unit price of capital impacts positively of bank's returns by 0.48, this indicates that decision by banks to spend more on expansion of physical branches, spending more on technological equipment has positive effects on bank's returns. Increase unit price of fund leads to increase in bank's returns by 0.35; this means more deposits acceptance by banks hence increase in interest expense but also implies increase in asset base for the bank. Other than the factor input variables, banks specific variables also contribute to ROA with different proportions. The result indicate that increase in unit of TA leads to 0.51 increase in bank's returns while, increase in unit of CATM and GDP leads to an increase in bank's returns by 0.15. TA has positive impact ROA, increase in unit of TA leads to increase of ROA by half. Such high proportion indicates that banks are focusing more on asset management, diversified loan products and serious scrutiny of loan applicants in order to arrive at proper resource allocation decisions through issuance of credit to productive firms. Increase in CATM also shows a positive impact on ROA whereby

ATMs improve on banks' operational efficiency with reduction in operational costs. The positive relation between GDP and ROA reflects on how banking performance depends on state of macro-economic economic environment.

NPLTL has negative impact on return on assets, this shows that loan defaulters remain a challenge to the banking sector. Further, the results indicate that IETD, EETA, DEFA, NPLTL, CATM, TA are significant at 1% level while GDP is significant at 5% level. All the variables are significant in determining market equilibrium and banking sector performance through ROA with R-squared value of 0.73 that is 73%.

### Competition in the Banking Sector

The study relies on P-R model to measure the nature of competition in Kenya's banking industry. Table 3 provides a summary of coefficients for all variables in equation 5 through regression analysis. The H-statistic value in reference to equation 2 as per the findings is 0.716; and is derived from sum of the input factors LOGIETD, LOGEETA, LOGDEFA coefficients.

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The study findings indicate that both factor input and bank's specific variables in this model are significant at 1% level while macro-economic variable; GDP is significant at 5% level. The coefficients for factor input variables are all positive, this indicates that factor input values have a positive effect on

total revenue to total asset ratio for commercial banks in Kenya. For instance, for every increase unit price for factor input variables; IETD, EETA and DEFA there will be increase in total revenue to total asset ratio by 0.23, 0.45 and 0.04 respectively.

**Table3.** Estimates of Competitive Nature with Log TRTA as the Dependent Variable

Variables	Coeff	Std. Error	t-Stat	Prob.
C	4.03	2.31	1.74	0.101
LOGIETD	0.23	0.08	2.71	0.02
LOGEETA	0.45	0.38	1.19	0.25
LOGDEFA	0.04	0.15	0.26	0.80
LOGNPLTL	-0.03	0.11	-0.30	0.77
LOGTA	0.14	0.13	1.09	0.29
LOGCATM	-0.142	0.06	-2.21	0.04
LOGGDP	0.001	0.04	0.06	0.95
H-Statistic	0.716			

The H value of 0.716 meets the 3rd condition of H-Statistic value as interpreted in table 1 whereby  $0 < H < 1$  condition confirms that Kenya's banking market is monopolistic in nature. According to M. D. Delis (2010) if H-value is close to zero (0) then the market is characterized as less competitive and if H-value is close to one (1) then the market is characterized to be more competitive. DEFA, which represents unit price of capital, contributes the least as compared to unit price of labour and fund. This implies that physical and intellectual capital can contribute to generation of bank revenue but very minimal.

Bank's specific variables have mixed effects on bank's total revenue. Increase in NPLTL has negative effect on bank revenue whereby increase per unit leads to decrease of total revenues by 0.03 while increase per unit price of CATM also decreases revenue by 0.14. An upward change in unit of TA leads to an upward change in bank revenue by 0.14.

### CONCLUSION AND RECOMMENDATIONS

In this research paper, factor prices, bank's specific variables and macro-economic variables contribute to the nature of competition in the banking market. The same factors are also used in determining whether the banking market is equilibrium or disequilibrium in nature and bank performance in the long run. Panzar-Rosse model employed in this study indicates that there exists monopolistic competition in Kenya's banking market.

In the long run, the study found out that the banking market in Kenya is disequilibrium in nature for the period under study with E-value

of -0.027. There has been major developments in the banking sector since 1994 among them, mergers and acquisitions, closure of banks, other banks put under receiverships not forgetting liquidity challenges, management challenges and world financial crisis in early 1990s and 2007/2008 which largely affected the banking sector and the finance industry at large. With return on assets as the dependent variable, the regressed coefficients for factor inputs, IETD and DEFA had positive signs. DEFA, unit price of labour has a negative sign, meaning, in the long run, increased cost of labour will have a negative effect on return on assets for banks, this can be attributed to increased technology which replaces roles carried out by employees. Positive sign for unit price of capital indicates that higher cost of capital leads in increase in return on assets in the long run. Therefore, bank's decision to incur more capital expenditures; intellectual capital, physical capital tend to increase return on assets despite costs implications.

The non-equilibrium nature of the banking sector market in Kenya does not mean the sector is not performing. All independent variables in the study, EETD, EETA, DEFA, NPLTL, TA, CATM, GDP contributes 73% of bank performance. Other variables not included in this study forms 27%. TA is the largest positive contributor for ROA and cost of labour largely affecting ROA negatively.

Factor inputs; unit price of labour, unit price of capital and unit price of fund all have positive effect on nature of competition in the banking sector due to individual positive coefficients

totaling to H-statistic value of 0.716 during the overall sample period. The positive H –statistic value meets 3rd condition of competition in the banking market ( $0 < H < 1$ ). The H-value indicates that banks in Kenya do generate their revenue through conditions of monopolistic competition. Non-performing loans impacts negatively on both bank's revenue and return on assets, this poses higher risk exposure by banks in the long run in issuance of loans due to loan defaulters which in return reduces amount available for lending. Increase in number of ATMs have negative impact on revenue, this indicates that installation of ATMs comes with its own costs, which tend to benefit customers more, However ATMs cannot be ruled out due to technological aspect they represent in the study towards cost and operational efficiency. As the world advances in term of technology, adoption of alternative more cost effective delivery channels is rendering use of ATMs irrelevant towards generation of bank's revenue.

The study findings also indicate a positive relationship between bank's revenue and GDP growth. Therefore, the competitive environment for banks tend to have a positive impact on countries GDP growth and a growing economy paves way for conducive environment for the competitive banking market.

Since the banking sector seems to be competitive in nature, individual banks needs to balance the various factors inputs and specific bank variables in efforts to ensure they also remain competitive. The challenge of non-performing loans need to be taken seriously by ensure bank's management take necessary measure to ensure allocation of resources through issuance of credit benefits most productive firms or sectors of an economy. Despite stringent measures to deal with loan defaulters, relevant government bodies need to come in handy to ensure any loan default offence is punishable accordingly under the law.

The study recommends for further research in efforts to determining nature of bank competition in both developed and developing countries.

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