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RESEARCH ARTICLE

INFLUENCE OF FINANCIAL DEPTH ON FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN RWANDA

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Abstract

The link between banking development and economic growth has long received significant attention in research, however, the waves of banking development cannot raise the tide of the economy without affecting financial performance of commercial banks; it is against this background that this study was formulated with the main objective of establishing the influence of Financial Depth on financial performance of commercial banks in Rwanda. In this paper financial depth was proxied by Broad money and credit to private sector, financial performance proxied by return on Assets (ROA), and both moderated by inflation proxied by consumer price index. This study collected and analysed both primary and secondary data. The study concluded that financial depth has a positive and significant influence on financial performance of commercial banks in Rwanda. Interestingly enough, this study found that credit to private sector negatively influence profitability of commercial banks in Rwanda due to rising NPL's, meaning that the commercial banks in Rwanda are venturing in more riskier lending practices. Bank deposits which was a measure of banking sector liquidity was found to be positively influencing profitability but negatively influencing cost of intermediation measured by net interest margin indicating efficiency in the banking sector. To that end Broad money and inflation also had significant influence on ROA, and therefore the study recommends that unless bank profitability depends on whether inflation expectations are fully anticipated. An inflation rate fully anticipated by the bank's management implies that banks can appropriately adjust interest rates in order to increase their revenues faster than their costs and thus acquire higher economic profits. The study recommends that commercial banks in Rwanda need to reduce problem assets as high nonperforming loans dampen banks' potential lending capacity and, by extension, their ability to build up capital buffers. On inflation, full anticipation is required, because an inflation rate fully anticipated by the bank's management implies that banks can appropriately adjust interest rates in order to increase their revenues faster than their costs and thus acquire higher economic profits.

Introduction:-

Financial intermediation is the process through which financial institutions transfer financial resources from surplus units of the economy to deficit ones. However, for financial institutions to discharge this role effectively, they have

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to be developed in terms of liquidity, variety of financial assets and efficiency in credit allocation. Rajan and Zingales (2002) concisely reasoned that a developed financial sector should reflect the ease with which entrepreneurs with sound projects can obtain financial resources, and the confidence with which investors anticipate adequate returns. The system should also be able to gauge, subdivide, and spread difficult risks, letting them rest where they can best be borne and should be able to do all these at low cost. With this, more savings, investment and high productivity would be ensured which would lead to hi bank performance and hence economic growth.
The capacity of Rwanda banks, especially commercial banks, is to accept deposits from the general public for the purport of lending and investment. This makes depositors the major stakeholders of the banking system. While sundry deposits products by banks are assigned different names for which they are designated to accommodate varying purposes, the deposit products of commercial banks can be broadly categorized into demand deposits, savings deposits, and term or fixed deposits. The Banks provide various services to sectors of the economy, for example liquidity services, information, maturity intermediation, transaction cost, credit allocation, payment services, and money supply services, among others (Elsevier, 2014).

The size of the local economy and prevailing legal restrictions as well as consumers propensity to save, coupled with other financial variables have an important influence on the growth of deposits with banks. With competition intensified through the process of financial liberalization, banks are being compelled to compete for deposits in various forms so as to increase their financial performance (Haron & Azmi, 2006).

The banking sector in Rwanda is expected to be even more vibrant in coming years.Deposits from individuals and private enterprises have been and continued to be contributing the largest share of bank's total deposits. Savings according to conventional economists is the excess income over consumption expenditure (Keynes, 1936). However a number of factors have been found to influence deposits of banks, especially commercial banks. In Malaysia, Haron and Wan Azmi (2006) investigates the structural determinants of deposits level of commercial banks. The study found rates of profit, rates of interest, base lending rates, money supply, Consumer Price Index (CPI), Kuala Lumpur Composite Index, and Gross Domestic Product (GDP) to have significant impact on deposits. Commercial banks play vital role in the Rwanda as they aid individuals, and organizations (small, medium, or large) continue to meet their ever growing credit demands. For commercial banks to be able to meet this growing demand for credit by both micro and macro units (households and firms), it is however necessary to enhance the deposit rate or the willingness of the public to reduce the propensity to hold cash but still be able to have a better financial performance (Nishat and Bilgrami, 1989).

Chortareas et al. (2011) noted that regardless of the transmission channel, however, one would expect that the waves of development financial sector cannot raise the tide of the economy without affecting bank performance, particularly in emerging economies where the banking sector is the main supplier of funds to the financial system. Thus, financial performance analysis of commercial banks has been of great interest to academic research since the Great Depression in the 1940's. In the last few decades studies have shown that commercial banks in Sub-Saharan Africa (SSA) are more profitable than the rest of the world with an average Return on Assets (ROA) of 2 percent (Flamini et al., 2009). One of the major reasons behind high return in the region was investment in risky ventures. The other possible reason for the high profitability in commercial banking business in SSA is the existence of huge gap between the demand for bank service and the supply thereof. That means, in SSA the number of banks are few compared to the demand for the services; as a result there is less competition and banks charge high interest rates. This is especially true in East Africa where the few government owned banks take the lion's share of the market. The performance of commercial banks can be affected by internal and external factors (Al-Tamimi, 2010; Aburime, 2005). These factors can be classified into bank specific (internal) and macroeconomic variables. The internal factors are individual bank characteristics which affect the bank's performance. These factors are basically influenced by the internal decisions of management and board. The external factors are sector wide or country wide factors which are beyond the control of the company and affect the performance of banks.

In Rwanda though, the banking sector has evolved in recent years with the entry of new banks especially from the East African region, the number of banks as well as the size of the banking sector have expanded significantly amid banks efforts to increase their outreach. The Rwandan Government drive to enhance financial inclusion also contributed to this positive evolution and has increased competition (Kigabo & Nyilihama 2015). The Rwanda's financial system remains dominated by banking sector, which represents 67.6 percent of the system's total assets with the microfinance institutions and the non-banking financial institutions accounting for 5.6 percent and 26.7

percent (insurance 9.4 percent and pension 17.3 percent) respectively (BNR, 2016). Another important player though still at infant stages is capital market with few listed companies.

Banking system in Rwanda comprises of 12 commercial banks, 3 microfinance banks, and 1 cooperative bank. The sectors' performance has been growing tremendously and such growth is attributed majorly to the credit to private sector (cps). The outstanding cps has been increasing over time with the new outstanding loans to the private sector significantly increasing from RWF. 61.7 billion in 2005 to RWF. 990.6 billion by the end of the year 2015 with interest charged remaining relatively lower compared to other East African Countries (BNR monetary policy statement, Feb.2016). Therefore following Boyd and De Nicolo (2005) and Martinez-Miera and Repullo (2010), this study assumes that firms' investment decisions are subject to moral hazard, so that a higher interest rate leads them to take riskier investment projects that may lead to poor performance.

Therefore the main objective of this paper is to establish the influence of financial depth on financial performance of commercial banks in Rwanda for the period between 2011 and 2015. Financial Depth in this study is proxied by Broad Money and Credit to Private Sector while financial performance is proxied by ROA.

Literature review:-

This study reviewed literature on relationship between financial depth and financial performance of commercial banks in Rwanda. The literature reviewed in this section is divided into theoretical review and empirical review.

Thoeritical Review:-

Agency Theory:-

Jensen and Meckling (1976) focus on principal-agent relation asymmetries. It is a theory explaining the relationship between principals such as shareholders, and agents, such as a company's executives in this relationship the principal delegates or hires an agent to perform work. The theory attempts to deal with two specific problems: first the goals of the principal and agents are not in conflict agency problem and second the principal and agent reconcile different tolerance for risk. Diamond and Dybvig (1983) consider banks as coalitions of depositors that provide households with insurance against idiosyncratic shocks that adversely affect their liquidity position. Diamond (1984) shows that these intermediary coalitions can achieve economies of scale. Financial intermediary acts as delegated monitors on behalf of ultimate savers.

Monitoring will involve increasing returns to scale, which implies that specializing may be attractive. Individual households will delegate the monitoring activity to such a specialist, i.e. to the financial intermediary. The households will put their deposits with the intermediary. They may withdraw the deposits in order to discipline the intermediary in his monitoring function. Furthermore, they will positively value the intermediary's involvement in the ultimate investment (Hart, 1995).

Hart and Moore (1995), Qi (1998) and Diamond and Rajan (2001) show that deposit finance can create the right incentives for a bank's management. Illiquid assets of the bank result in a fragile financial structure that is essential for disciplining the bank manager. Note that in the case households that do not turn to intermediated finance but prefer direct finance, there is still a "brokerage" role for financial intermediaries, such as investment banks (Baron, 1979 and 1982). Here, the reputation effect is also at stake. In financing, both the reputation of the borrower and that of the financier are relevant (Hart and Moore, 1998).

Dinç (2001) studies the effects of financial market competition on a bank reputation mechanism, and argues that the incentive for the bank to keep its commitment is derived from its reputation, the number of competing banks and their reputation, and the competition from bond markets. These four aspects clearly interact. This theory generally informs the study that despite the mechanisms in place to screen creditors, structure of the bank is also important in determining the bank performance.

Market Power Theory and Efficient Structure Theory:-

The MP hypothesis, which is sometimes also referred to as the structure conduct performance (SCP) hypothesis, asserts that increased market power yields monopoly profits. A special case of the MP hypothesis is the relative-market-power (RMP) hypothesis, which suggests that only firms with large market shares and well-differentiated products are able to exercise market power and earn non competitive profits. Likewise, the *X*-efficiency version of

the ES (ESX) hypothesis suggests that increased managerial and scale efficiency leads to higher concentration and, hence, higher profits. The efficient-structure theory also includes two hypotheses, the X-efficiency and scale efficiency hypotheses. The X-efficiency hypothesis argues that banks with better management and practices control costs and raise profit, moving the bank closer to the best-practice, lower bound cost curve. The scale-efficiency hypothesis argues some banks achieve better scale of operation and, thus, lower costs. Lower costs lead to higher profit and faster growth for the scale-efficient banks. In general ES theory suggests that enhanced managerial and scale efficiency leads to higher profitability.

Studies, such as those by Smirlock (1985) and Berger (1995a) investigated the profit-structure relationship in banking, providing tests of the aforementioned two hypotheses. To some extent the RMP hypothesis is verified, since there is evidence that superior management and increased market share (especially in the case of small to medium sized banks) raise profits.

In contrast, weak evidence is found for the ESX hypothesis. According to Berger (1995a), managerial efficiency not only raises profits, but may lead to market share gains and, hence, increased concentration, so that the finding of a positive relationship between concentration and profits may be a spurious result due to correlations with other variables. Thus, controlling for the other factors, the role of concentration should be negligible. Other researchers (Bourke, 1989; Molyneux and Thornton, 1992) argue instead that increased concentration is not the result of managerial efficiency, but rather reflects increasing deviations from competitive market structures, which lead to monopolistic profits. Consequently, concentration should be related to bank profitability. A rather interesting issue is whether the ownership status of a bank is related to its profitability. However, little evidence is found to support the theory that privately-owned institutions will return relatively higher economic profits (Short, 1979). In contrast, Bourke (1989) , Molyneux and Thornton (1992) report that ownership status is irrelevant for explaining profitability.

Balanced portfolio Theory:-

According to Nzongang and Atemnkeng in Olweny and Shipho (2011) balanced portfolio theory also added additional dimension into the study of bank performance. It states that the portfolio composition of the bank, its profit and the return to the shareholders is the result of the decisions made by the management and the overall policy decisions. From the above theories, it is possible to conclude that bank performance is influenced by both internal and external factors. According to Athanasoglou et al. (2005) the internal factors include bank size, capital, management efficiency and risk management capacity. The same scholars contend that the major external factors that influence bank performance are macroeconomic variables such as interest rate, inflation, economic growth and other factors like ownership.

Emperical Review:-

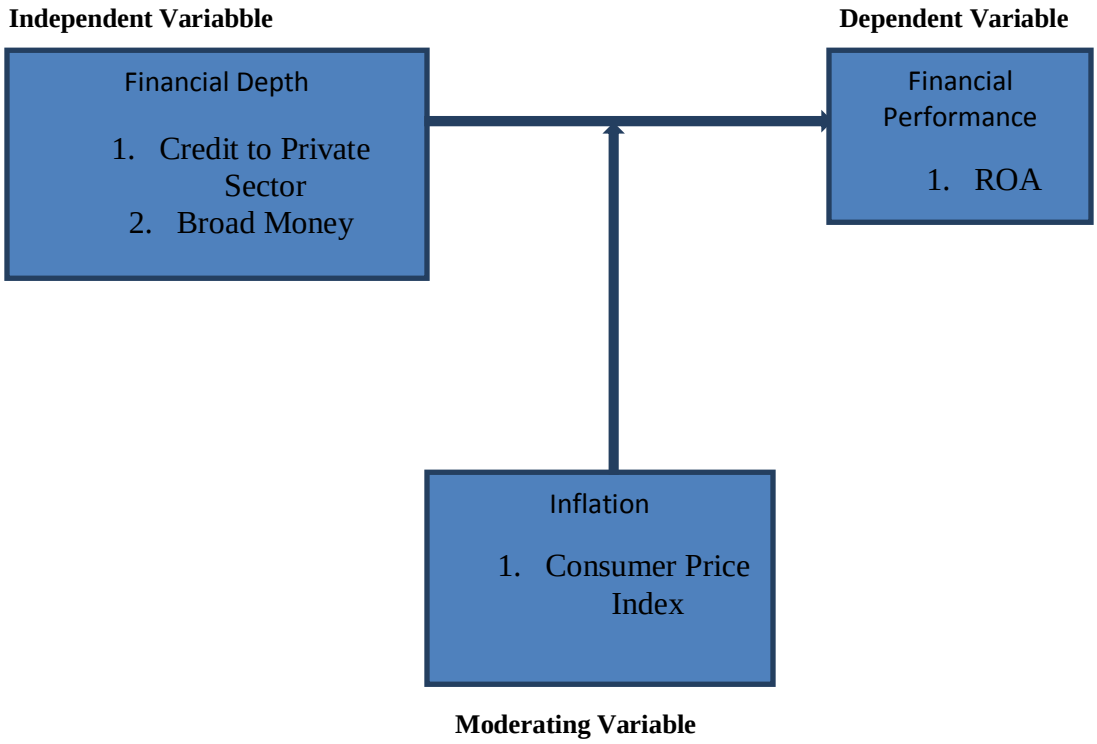
Financial deepening generally entails an increased ratio of money supply to gross domestic product (Nnanna and Dogo, 1998; and Nzotta, 2004). Financial deepening is thus measured by relating monetary and financial aggregates such as M1, M2 and M3 to the gross domestic product (GDP). The logic here is that, the more liquid money is available in the economy, the more opportunities exist for the growth of the economy. Financial deepening can therefore be defined as the ratio of money supply to GDP, is a function of domestic credit provided by banking industry as a percentage of GDP, domestic credit to private sector as a percentage of GDP (Levine, 1997).

Guillaumont, Hua, and Liang (2006) study the finance-productivity growth in China for 1993–2001. They use the Malmquist index and its components (namely the technical and efficiency change) to measure productivity and found that financial deepening does affect productivity in China, particularly through efficiency change. In Latin America, Chortareas et al. (2011) studied the financial depth-banking productivity nexus. They considered nine Latin American countries and estimate banking productivity for each of them using the Malmquist TFP index. The results revealed an unambiguously positive and statistically significant relationship, suggesting that financial deepening is an important determinant of banking productivity increases. Their study also uncovered evidence of a reverse causality between the two variables, as a number of plausible channels implies. In the literature, bank profitability is usually expressed as a function of internal and external determinants. The internal determinants could be termed micro or bank-specific determinants of performance. The external determinants are variables that are not related to bank management but reflect the economic and legal environment that affects the operation and performance of financial institutions (Athanasoglou et al, 2008). The research undertaken has focused on profitability analysis of either cross-country or individual countries' banking systems. The first group of studies includes Short (1979), Bourke (1989), Molyneux and Thornton (1992) and Demirguc-Kunt and Huizinga (2000).

Athanasoglou et al. (2008) explained this result by taking into account the fact that the more financial institutions are exposed to high-risk loans, the higher is the accumulation of unpaid loans, implying that these loan losses have produced lower returns to many commercial banks. Bank expenses are also a very important determinant of profitability, closely related to the notion of efficient management. There has been an extensive literature based on the idea that an expenses-related variable should be included in a profit function. For example, Bourke (1989) and Molyneux and Thornton (1992) find a positive relationship between better-quality management and profitability. Turning to the external determinants of bank profitability, it should be noted that we can further distinguish between control variables, such as inflation, interest rates and cyclical output, and variables that represent market characteristics. The latter refer to market concentration, industry size and ownership status. A whole new trend about structural effects on bank profitability started with the application of the market-power (MP) and the efficient-structure (ES) hypotheses. The MP hypothesis, which is sometimes also referred to as the structure-conduct-performance (SCP) hypothesis, asserts that increased market power yields monopoly profits. A special case of the MP hypothesis is the relative-market-power (RMP) hypothesis, which suggests that only firms with large market shares and well-differentiated products are able to exercise market power and earn non competitive profits. Likewise, the *X*-efficiency version of the ES (ESX) hypothesis suggests that increased managerial and scale efficiency leads to higher concentration and, hence, higher profits. Studies, such as those by Smirlock (1985) and Berger (1995a) investigated the profit–structure relationship in banking, providing tests of the aforementioned two hypotheses. To some extent the RMP hypothesis is verified, since there is evidence that superior management and increased market share (especially in the case of small- to medium-sized banks) raise profits.

Conceptual Framework:-

This section illustrates the relationship between the independent variable financial depth measured by broad money and credit to private sector and the dependent variable financial performance measured by return on assets. These two variables are being moderated by inflation.



Methodology:-

The target population for this study was at two levels; the first target population was at institutional level where the study targeted all the 12licensed commercial banks in Rwanda, the second target population were senior management employees of the 12 commercial banks in operation in Rwanda as at 31st December, 2015 (BNR, 2015). Therefore in this study the target population comprises of all senior management employees of all the 12 commercial banks in Rwanda. The sampling frame for this study also consists of all the licensed commercial banks operating in Rwanda as at December, 2015. The entire target population constitutes of twelve (12), but only six (6) were purposively chosen since they had been licensed by National Bank of Rwanda from the year 2011. Besides having purposively sampled six (6) banks, this study used judgmental sampling for distribution of the questionnaires to respective electronic banking managers, retail credit risk managers, CFO's and their assistants. However for triangulation, additional questionnaires were distributed to the respective CEO's of the sampled commercial banks. Therefore a sample of 42 questionnaires were used and distributed to the banks. In addition, secondary data from the sampled banks were also collected on; ROA, Broad Money, total Credit to Private Sector and Consumer Price Index. This secondary data were collected from the National Bank of Rwanda, National Institute of Statistics Rwanda, World Bank reports and annual reports of the banks from a period of 2011-2015.

The study used descriptive statistics and inferential statistics. In this paper, the multiple linear regression models were used. This adopted model is similar to that used by many of the studies done in the area of financial depth and financial performance (Ngumi, 2013; Ogilo, 2012; Ngigi, 2012; Chang, 2007; Waithaka and Ngugi, 2013; Agostino and Mazzuca, 2010). The general model to establish the influence of the financial depth on finanacial performance in commercial banks in Rwanda is shown below.

1. $ROA_t = \beta_0 + \beta_1 m_{3_t} + \beta_2 cps_t + \beta_3 cpi + \varepsilon_t$ 4.1

Where;

$ROA =$ Return On Assets,

m_3 =Broad Money

cps = Credit to Private Sector

cpi = Consumer Price Index

β_0 = Intercept

β_1, β_2 and β_3 = slopes

ε = Error term

Results:-

Descriptive statistics Results:-

This section presents the findings and discussion of the study's main objective. Frequencies and descriptive statistics are presented this section. The questionnaire responses were based on a likert scale which was coded with numerical values for ease of data analysis. The values assigned to the likert were 1=strongly disagree, 2=disagree, 3=neutral, 4=agree and 5=strongly agree.

Influence of Financial Depth on Financial Performance of Commercial Banks:-

The first objective of the study was to establish the influence that financial depth have on financial performance of commercial banks in Rwanda. The objective was assessed by use of likert scaled statements which were on the questionnaire where the respondents indicated their degree of agreement with the statements.

Influence of broad Money on Financial performance:-

Data on Table 4.1 show responses on statements regarding the influence of Broad money on financial performance of commercial banks in Rwanda. In the first part of the table, 90% of the respondents agreed that broad money positively influenced ROA of the commercial banks, while 10% were indifferent and none of the respondents disagreed with the statement that broad money have a positive influence on ROA of commercial banks in Rwanda. The mean score of responses regarding Broad money was 3.4 on a 5 point scale. The average overall standard deviation of 0.43 infers that 68% of the responses were spread within one standard deviation of the overall mean. The standard deviation for each response line is also shown on the Table 4.1. The standard deviation statistical rule of 68%, 95% and 99.7% applies in all the interpretations in the rest of the document. This means that one standard

deviation has 68% of the data spread around the mean and 95% for two standard deviations and 99.7% for three standard deviations.

These results corroborate with a study conducted by Arestis, Chortareas, and Desli (2006) in OECD countries,which concluded that Broad Money were capable of improving bank's ROA. Diamond (1999) also confirms these findings in a study conducted in Europe which found that broad money assisted banks to improve their financial performance. This finding seems to be consistent with the evidence that an increase in the supply of broad money in Rwanda economy leads to significant economic growth (Okello, Kigabo & Kitambala, 2015).

Table 4.1:- Broad Money and ROA.

Statement	%Strongly disagree	%Disagree	% Neutral	%Agree	%Strongly agree	Mean	Standard deviation
1. Increase in Broad money has a positively influenced ROA			10	20	70	**3.4**	**0.43**
Average						**3.4**	**0.43**

Influence of Credit to Private Sector on Financial performance:-

Table 4.2 below indicates that 95% of the respondents believed that increase in credit to private sector increases the ROA of commercial banks in Rwanda, while only 4% were indifferent to the fact that an increase in credit to private sector has a positive influence on ROA. Only 1% of the respondents disagreed. The mean score of the responses was 3.5 which indicate that majority of the respondents agreed with the statements on the assertion that Credit to private sector had the potential of improving financial performance of commercial banks. The average standard deviation of 0.299 means that, 68% of the responses were within one standard deviation from the mean. Rajan (1999) while assessing the effects of credit to private sector on financial performance in Malaysian commercial banks found a positive relationship between the two variables. In the case of Jordan, Kour and Fayoumi (2007) reports that credit to private sector were very effective of in influencing the performance (measured by ROA) of commercial banks in Jordan.

Table 4.2:- Credit to Private Sector and ROA.

Statement	%Strongly disagree	%Disagree	% Neutral	%Agree	%Strongly agree	Mean	Standard deviation
2. Increase in Credit to Private Sector has a positively influenced ROA		1	4	26	69	**3.5**	**0.299**
Average						**3.5**	**0.299**

From both table 4.1 and 4.2 above, it is evident that financial depth influence performance of commercial banks in Rwanda. Arbabian and Geraili (2009) addressed to study the effect of capital structure on the profitability of companies accepted in Tehran's stock exchange. The results of their research showed that there is a positive relationship between the financial depth and financial performance as well.

Inferential Statistics Results:-

From the above model 4.1, multiple linear regression analysis that was performed to find out whether financial depth had a positive significant influence on ROA and the results presented in table 4.3 below and written as $ROA_t = -9.7 + 2.7m_{3t} - 1.37cps_t + 0.44cpi + \varepsilon_t$. In conclusion, it is evident that Broad money has a positive and significant influence on ROA, and credit to private sector has a negative but significant influence on ROA. This finding is in line with the descriptive statistics analyzed earlier in this study and the study conducted by Arestis, Chortareas, and Desli (2006) in OECD countries, which concluded that broad money were capable of improving bank's ROA, ROE but that credit to private sector would have a negative influence on ROA, ROE. Diamond (1999) also confirms these findings in a study conducted in europe which found that broad money assisted banks to improve their financial performance. This finding seem to be consistent with the evidence that an increase

in the supply of broad money in Rwanda economy leads to significant economic growth (Okello, Kigabo & Kitambala, 2015). However, these findings arre in line with the findings of European union Central Bank (2015) that reveal credit to pricate sector as having a negative influence on profitability, because of significant increase in none performing loans. Therefore Rwandan commercial banks profitability has increased marginally and asset quality deterioration has slowed down. Still, profitability remains weak and the return on assets (ROA) continues to remain below the cost of capital for many banks. Looking ahead, a further reduction of problem assets is needed as high nonperforming loans dampen banks' potential lending capacity and, by extension, their ability to build up capital buffers.

Table 4.3:- Regression analysis of Financial Depth and ROA .

Dependent Variable: ROA				
Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	**Prob**.
C	-9.717055	13.82287	-0.702970	0.6099
CPI	0.447273	0.649745	0.688382	0.0500
CPS	-1.376086	1.864986	-0.737853	0.0503
M3	2.795407	3.369752	0.829559	0.0091
R-squared	0.783791	Mean dependent var		1.804391
Adjusted R-squared	-0.984836	S.D. dependent var		0.472947
F-statistic	0.338427	Durbin-Watson stat		1.766023
Prob(F-statistic)	0.015887			

Goodness of Fit :-

In order to test the research objectives using regression analysis in the model equation 4.1, the researcher analyzed the goodness of fit of the regression line using the correlation coefficient (R^2) which is equal to 78.3% from table 4.3 above (model summary). This means that 78.3% % of variation in the dependent variable (ROA) can be explained jointly by the independent variables $(m_3, cpsy, cpi)$ with only 12.7% of the variation in dependent variable (y) can be explained by the error-term (ε) or other variables other than $(m_3, cpsy, cpi)$. Therefore, from the analysis, the regression line of the model is strongly fitted to the data.

To test if each and every independent variable in model 4.1 is individually significant in influencing the dependent variable (ROA), the researcher considered the probability of $t-statistics$ from table 4.3 above. This led to the formation of the hypothesis for each Individual variable as follows:

Significance of Broad Money (m_3) on Return on Assets (ROA)

$H_0 : \beta_1 = 0$ if the probability of $t-statistics$ is $> 5\%$

$H_1 : \beta_1 \neq 0$ if the probability of $t-statistics$ is $< 5\%$

From the above table 4.3, the probability of the $t-statistics$ is equal to 0.9% which is less than 5%, therefore the researcher rejected the null hypothesis and accepted the alternative hypothesis which means that the Independent Variable (m_3) significantly influences the Dependent Variable (ROA). However, the direction of the influence can't be identified at this point, because the alternative hypothesis only shows the evidence of a relationship between the Dependent Variable and the Independent Variable.

Significance of Credit to Private Sector (cps) on Return on Assets (ROA)

$H_0 : \beta_2 = 0$ if the probability of $t-statistics$ is $> 5\%$

$H_1 : \beta_2 \neq 0$ if the probability of $t-statistics$ is $< 5\%$

From the above table 4.3, the probability of the $t-statistics$ is equal to 5% which is equal to 5%, therefore the researcher rejected the null hypothesis and accepted the alternative hypothesis which means that the Independent Variable (cps) significantly influences the Dependent Variable (ROA). However, the direction of the influence can't be identified at this point, because the alternative hypothesis only shows the evidence of a relationship between the Dependent Variable and the Independent Variable.

Significance of Consumer Price Index (cpi) on Return on Assets (ROA)

$H_0 : \beta_3 = 0$ if the probability of $t-statistics$ is $> 5\%$

$H_1 : \beta_3 \neq 0$ if the probability of $t-statistics$ is $< 5\%$

From the above table 4.3, the probability of the $t-statistics$ is equal to 5 % which is equal to 5%, therefore the researcher rejected the null hypothesis and accepted the alternative hypothesis which means that the Independent Variable (cpi) significantly influences the Dependent Variable (ROA). However, the direction of the influence can't be identified at this point, because the alternative hypothesis only shows the evidence of a relationship between the Dependent Variable and the Independent Variable.

Joint Significance

To measure the joint significance between the Independent Variables (m_3, cps, cpi) and the dependent variable (ROA), the researcher considered the value of probability $F-statistics\,(ANOVA)$ from table 4.3 above. This lead to the formation of the hypothesis bellow:

$H_0 : \beta_1 = \beta_2 = \beta_3 = 0$ if the probability of $F-statistics$ is $> 5\%$

$H_1 : \beta_1 \neq \beta_2 \neq \beta_3 \neq 0$ if the probability of $F-statistics$ is $< 5\%$

Since the probability of the $F-statistics$ from table 4.3 above is equal to 1.5%, which is less than 5%, the researcher rejected the null hypothesis and failed to reject the alternative hypothesis meaning that all the Independent Variables (m_3, cps, cpi) have significant joint effect on the Dependent Variable (ROA).

Normality Test of the Residuals in model 4.1

The standard assumption in linear regression is that the theoretical residuals are independent and normally distributed. The observed residuals are an estimate of the theoretical residuals, but are not independent (there are transforms on the residuals that remove some of the dependence, but still give only an approximation of the true residuals) Indiana, (2011). To test for normality in the population residuals, the study used Jaque-Bera test whose results are shown in figure 4.1 bellow.

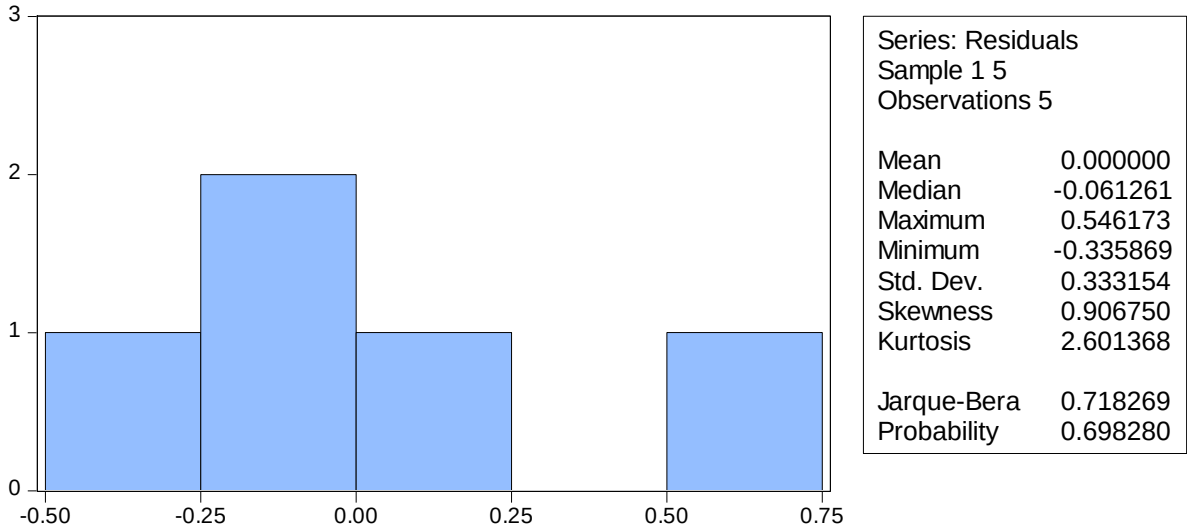


Figure 4.2 Histogram-Normality Test for Normality of the Residuals in model 4.1

To analyze the results of Jarque-Bera test in figure 4.1 above, the researcher set the following hypothesis;

H_0 : Residuals are normally distributed if probability of Jarque-Bera statistics $> 5\%$

H_1 : Residuals are not normally distributed if probability of Jarque-Bera statistics $< 5\%$

The probability of Jarque Bera statistics from the figure 4.1 above is 69% which is greater than 5%, hence the researcher failed to reject the null hypothesis implying that the residuals are normally distributed.

Conclusion and policy recommendations:-

This study concludes that financial depth has a positive significant influence on financial performance and therefore the null hypothesis was accepted. It is also important to draw a conclusion to the fact that credit to private sector specifically as a measure of financial depth has a negative and significant influence on profitability of commercial banks in Rwanda, this is due to high rates of nonperforming loans (NPL's) in this sector. This conclusion draws attention of Schumpeter innovation theory in which he emphasised heavily that the special role of credit-creation by bankers was 'the monetary complement of innovations' (Schumpeter, 1939). As independent agents who have no proprietary interest in the new enterprises they finance, bankers are the capitalists who bear all the risks (none is borne by the entrepreneurs). That requires having the special ability to judge the potential for success in financing entrepreneurial activities. Schumpeter emphasized that it is just as important to deny credit to those lacking that potential as it is to supply credit to those having it (Schumpeter, 1939). According to BNR financial stability report (2015) the NPL's had been considerably reducing since June 2013, the same report holds that NPL reduced by 0.7% between June 2014-June 2015 but was forecasted through the watch loans which is an indicator of future loss to rise by December 2015 which seems to be confirmed by this study. This corroborate the findings of Kargbo and Adamu, (2009) who examined the relationship between financial depth and financial stability in Sierra-Leone for the period 1970–2008 and found the existence of a positive relationship. Rajan (1999) while assessing the effects of Broad money and credit to private sector on financial performance in Malaysian commercial banks found a positive relationship between the two independent variables and the dependent variable. In the case of Jordan, Kour and Fayoumi (2007) also reports that credit to private sector were very not very effective of in influencing the performance of commercial banks in Jordan.

Policy Recommendations:-

This study recommends that financial deepening is realized to be very important in enhancing return on Assets of commercial banks in Rwanda. With ROA being a major ratio that indicates the profitability of a bank. It is a ratio of

Income to its total asset (Khrawish, 2011) and measures the ability of the bank management to generate income by utilizing company assets at their disposal. In other words, it shows how efficiently the resources of the company are used to generate the income. It further indicates the efficiency of the management of a company in generating net income from all the resources of the institution (Khrawish, 2011). Wen (2010), state that a higher ROA shows that the company is more efficient in using its resources. The government of Rwanda should increase broad money supply but at manageable quantity, it is clear that the injection of money supply in the economy stimulates consumers spending and may reduce the level at which credit is sought by investors which further improves financial performance of commercial banks in Rwanda. Many studies in the past holds that an increase in money supply may lead to an increment in inflation rates, however it is hard to judge the level of money supply that would be consistent with a given level of inflation, due to changes in money demand. For example, Coenen, Levin and Wieland (2005) find that, in recent years, the extent of changes in money demand in the euro area have meant that money has fairly limited information content as an indicator and Dotsey and Hornstein (2003) find similar results for the United States.

This study also recommends that due to the increase in rates of NPL's, a further reduction of problem assets is needed as high nonperforming loans dampen banks' potential lending capacity and, by extension, their ability to build up capital buffers. Therefore commercial banks should restrict credit conditions, by reducing for example value of certain collaterals in order in increase constraints to access to finance. Inflation as well has a positive influence on ROA, this can be confirmed by the work of Revell (1979) who introduced the issue of the relationship between bank profitability and inflation. He notes that the effect of inflation on bank profitability depends on whether banks' wages and other operating expenses increase at a faster rate than inflation. The question is how mature an economy is so that future inflation can be accurately forecasted and thus banks can accordingly manage their operating costs. In this vein, Perry (1992) states that the extent to which inflation affects bank profitability depends on whether inflation expectations are fully anticipated. An inflation rate fully anticipated by the bank's management implies that banks can appropriately adjust interest rates in order to increase their revenues faster than their costs and thus acquire higher economic profits. Most studies (e.g. Bourke, 1989; Molyneux and Thornton, 1998) also assert this school of thought but reiterates that inflation is only influential if maintained below the double digits. Therefore as Rwandan government should continue to maintain inflation at single digit and further provide more financial liberalization to encourage banks to ease credit to private sectors.

References:-

1. Al-Tamimi, H., & Hassan, A. (2010). Factors Infuluncing Performance of the UAE Islamic and Conventional National Banks. . Department of Accounting, Finance and Economics, College of Business Administration, University of Sharjah.
2. Arestis, P., & Chortareas, G., & Desli, E. (2006). Financial development and productive efficiency in OECD countries: An exploratory analysis. *The Manchester School* vol. 74(4): 417–40.
3. Arestis, P., & Chortareas, G., & Desli, E. (2006). Financial development and productive efficiency in OECD countries: An exploratory analysis. *The Manchester School* vol. 74(4): 417–40.
4. Arestis, P., & Demetriades, P. (1997). Financial development and economic growth: assessing the evidence. *Economic Journal* Vol.107, pp. 783–799.
5. Arestis, P., & Demetriades, P., & Fattouh, B. (2003). Financial policies and the aggregate productivity of the capital stock. *Eastern Economic Journal* 29, no. 2: 217–42.
6. Athanasonglou, P.P., Sopholes, N.B., Mathtaios, D.D. (2005) Bank-specific, industry-specific and macroeconomic determinants of profitability. Working paper, Bank of Greece. 1(1), 3-4.
7. Berger AN. 1995. The Relationship between Capital and Earnings in Banking. Journal of Money Credit and Banking, 27(2): 432-456.
8. Berger, A.N., Hanweck, G.A., Humphrey, D.B., (1987). Competitive viability in banking: scale, scope and product mix economies. Journal of Monetary Economics 20, 501–520.
9. Bourke P. 1989. Concentration and Other Determinants of Bank Profitability in Europe, North America, and Australia. Journal of Banking and Finance, 13(1): 65-79.
10. Demirguc-Kunt, A., & Huizinga, H., (2000). Financial structure and bank profitability. Policy Research Working Paper Series 2430. The World Bank.
11. Demirguc-Kunt, A., and Maksimovic, V. (2002). Funding Growth in Bank-Based and Market-Based Financial Systems: Evidence from Firm Level Data, *Journal of Financial Economics*, Vol. 65, pp
12. Diamond, D., W. (1984). Financial intermediation and delegated monitoring. *Review of Economic Studies* 51, no. 3: 393–414.

13. Diamond, D., W., & Raghuram, A. (2000) A Theory of Bank Capital. *The Journal of Finance*. 52(6), 12-23.
14. Dinç, I., S. (2005). Politicians and banks: Political influences on government-owned banks in emerging markets. Journal of Financial Economics 77, 453-479.
15. Flamini, C., & Valentina C., & McDonald, G., & Liliana, S. (2009). The Determinants of Commercial Bank Profitability in Sub-Saharan Africa. *IMF Working Paper*.
16. Guillaumont, S., & Hua, P., & Liang, Z. (2006). Financial development, economic efficiency, and productivity growth: Evidence from China. *The Developing Economies* 44, no. 1: 27–52.
17. Haron, S., & N. Ahmad, (2000). The effects of conventional interest rates and rate of profit on funds deposited with islamic banking system in Malaysia. Intl. J. Islamic Financial Services, 1(4): 1-7.
18. Haron, S., & Wan, A., W. (2006). Deposit determinants of commercial banks in Malaysia. Creating Dynamic Leaders. Working Paper Series No. 009, 20(2).
19. Kargbo, S.M., & Adamu, P.A., (2009). Financial development and economic growthin Sierra
20. Keynes, J., M., (1936). The general theory of employment, interest, and money. Japan: Maruzen Co., Ltd.
21. Kigabo, R., T., & Nyilihama, C., (2015) (2015). Competition and financial stability. *African Journal of Business and Industry* Vol. (1) pp.50-77
22. Kigabo.R., T., & Okello, J., P., & Mutuyimana J., P. (2015). Financial Development, Monetary policy and Economic Growth in Rwanda . *BNR Economic Review*, Vol. (7) pp. 79-99
23. Leone. Journal of Monetary and Economic Integration Vol. 9(2), pp.30–61.
24. Levine, R. (1997). Financial Development and Economic Growth: Views and Agenda, *Journal of Economic Literature*, Vol. 32(2), 35, pp. 688–726.
25. Molyneux, P., & Thornton, J. (1992). Determinants of European bank profitability: a note. *Journal of Banking and Finance* 16, 1173–1178.
26. Moore, G., & Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information Systems Research*, 6(2), 144-176.
27. Moore, G., & Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information Systems Research*, 6(2), 144-176.
28. Nishat, M., & Bilgrami, N. (1989). Determinants of growth of bank deposits in Pakistan. Giordano dell-amore foundation. *Journal of economics and Development*, 13(4): 391-400.
29. Nnanna, O. J. (2004). Financial Sector Development and Economic Growth in Nigeria: *Economic and Financial Review* Sept. Vol. 42 (3).
30. Okello, J., P., & Kigabo, R., T., & Kitambala, M. (2015). Banking Development and Economic Growth in Rwanda. *African Journal of Business and Industry* Vol. (1) pp.50-77
31. Oloo, O. (2010). Banking Survey Report, The best banks this decade 2000-2009, Think Business Limited, Kenya, www.bankingsurvey.co.ke
32. Oloo, O. (2011). Banking Survey Report, The best banks this decade 2001-2010, Think Business Limited, Kenya, www.bankingsurvey.co.ke
33. Olweny, T., & Shipho, T., M. (2011). Effects of banking sectrol factors on the profitability of commercial banks in Kenya. *Journal of Economice and Finance.* Vol.1(5): 1-30.
34. Orodho, A., J. (2003). *Essentials of Educational and Social Sciences Research Method*. Nairobi: Masola Publishers.
35. Orodho, A., J., & Kombo, D., K. (2002). "*Research Methods*", Nairobi; Kenyatta University, Institute of Open Learning
36. Panayiotis, P., & Athanasoglou, (2006). Bank-specific, industry-specific and macroeconomic determinants of bank profitability. *Journal of International Financial Markets, Institutes and Money* 18 (2008) 121–136
37. Perry, M., O'Hara, K., Sellen, A., Brown, B., & Harper, R. (2001). Dealing with mobility: Understanding access anytime, anywhere. *ACM Transactions on Computer-Human Interaction*, 8(4), 323-347.
38. Rajan, R. G. & Zingales, L. (1998). Financial Dependence and Growth *American Economic Review* 88, 559-586
39. Revell, J., (1979). Inflation and financial institutions. Financial Times, London.
40. Smirlock, M. (1985) Evidence on the (Non) Relationship Between Concentration and Profitability in Banking. *Journal of Money, Credit and Banking*, 17 (1), 69-83
41. Waithaka, K. H. & Ngugi, K. (2013), Factors Influencing Acquisition of Stressed Assets and Asset Securitization into the Financial Market in Kenya, *International Journal of Social Sciences and Entrepreneurship.* Vol.1, Issue 2, 2013, 1 (2), 529-539
42. Wen, W. (2010). Ownership Structure and Banking Performance: New Evidence in China. Universitat Autònoma de Barcelona Departament D'economia de L'empresa, 2010.