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EFFECTS OF EXTERNAL ENVIRONMENTAL FACTORS ON THE FINANCIAL PERFORMANCE OF COMMERCIAL BANKS LISTED IN KENYA

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Abstract: **Banks are the link between savings from savers and productive activities by borrowers. A sound, competent and productive banking sector helps to overcome economic turbulence by making financial resources accessible to economic needs. External environmental factors play a key role towards this achievement. The wanting achievements in the banking sector has been attached to several problems; such as Political instability, economic turbulence, technological obsolescence among others (Obadan, 2004). The Kenyan Central Bank has provided Prudential Guideline on how banks should tackle these challenges. Most of the studies show that there is a mixed signal in relation to this study area. The heart of this study was the environmental factors that affect the performance in the Kenyan banks. It employed descriptive research design and use secondary data on market power, exchange rate fluctuations, technology use by the customers of the listed banks in Kenya. Data analysis was done using Stata (version 13) program. A regression model was run for external environmental factors on the financial performance. To measure the effects of environmental factors, the Market share, exchange rate fluctuation and non-branch transaction ratio were regressed on Returns on Asset. The non-stationarity assumptions were violated and so the researcher used VECM. The study finds that one unit change in the factors bears an increase in financial performance banks listed in the NSE. Only two of the factors are significant in explaining long term changes in the rate of financial performance in Kenya's' listed banks.**

Keywords: **Social-cultural factor, Economic factor and Technology factor.**

1. INTRODUCTION

Banking institution as part of the corporate world has been affected by both internal and external environmental factors in their operations and performance. The external environmental variables include the non-institutional factors that affect the financial results obtained by the firm. These factors are mainly influenced by environment outside a bank's management decisions and policy objectives (Furlong & Keeley, 1991). At external environmental level, performance is the direct result of managing various external environmental resources and of their efficient use within operational, investment and financing activities (Khalid & Kawai, 2013).The Social and cultural influence that a commercial bank has in terms of appeal to the social cultural factors such as gender and age determines its market power (Charles et al, 2016). Market power, one that gives a measure of Market Share, is built by how well the firm blends with the social cultural needs of the society (Mintzberg, 1987). Commercial banks have prevailed upon social cultural barriers where some have gone to an extent of using the area leaders to launch their brands in the area.

Statement of the problem

Delis and Tsionas (2009) did a study on bank efficiency and the market power of individual banks and conclude that certain banks do not engage in competitive behavior and that individual bank efficiency and market power are negatively correlated. Chirwa (2013) examined the relationship between market power and bank profitability in Malawi. The study findings supported the traditional collusion hypothesis. This is a contradiction the findings of Delis and Tsionas (2009).

Charles et al (2016) determines whether the movement in exchange rates has an effect on the profitability with a finding of negative and positive relationships between the two in the short and long run respectively. In a similar study locally, Otuoma (2016) hypothesized a high positive correlation. These results of Charles et al (2016) and Otuoma (2016) were dissimilar but were to a large extent in congruence with the findings by Uddin and Alam (2014) who finds that except Philippine all other countries under study have significant negative relationship between economic factors and profitability fluctuations. This study had focused on banks listed in the Dhaka Stock Exchange (DSE) using data from both developed and developing countries. Other studies involving the e-banking and performance show strong and positive relationships between e-banking and performance (Juma, 2012). These findings are contradicted by Okiro and Ndungu (2013). However, the study by Muyoka, 2014 did not holistically cover all forms of branchless banking such as mobile and agency banking

Other studies looking at how the bank innovations influence the bank performance finds only a moderate influence. However, these studies do not identify any individual effect of technological innovations on the performance (Boniface & Ambrose, 2015; Liang (2016). Overall, all these studies provide mixed and inconclusive evidence which may fail to show a clear relationship between performance and external environmental factors. Therefore, there is a necessity for more studies to be done after which the findings could be generalized to other areas with comparable characteristics.

Objectives

To establish the effect of the social-cultural factor on the financial performance of commercial banks.

To establish the effect of the economic factor on the financial performance of commercial banks.

To establish the effect of the technology factor on the financial performance of commercial banks

Theoretical review

The Resource Based Theory

Resource-based theory was proposed by Barney (1991) as a tool by the management for identifying the strategic resources that would help a company gain a competitive edge against competitors where it requires identifying some key resources that are needed (Charles et al, 2016). Based on an article titled "Firm Resources and Sustained Competitive Advantage" by Barney's 1991, competitive advantage is widely cited as a pivotal work against which this theory was introduced.

According to this theory, firms ordinarily are composed of heterogeneous resources used to pursue various strategies by making strategic resource mixes. From financial performance and debt (which is a capital resource), one would expect a positive relationship (Liang, 2016), which is a concurrence with several other study findings (Ramalho & Silva 2009; González & González 2012).

The Market Power theory

The market Power theory is a theory that looks into the size of the market covered by a firm. The theory is from Lerner (1934) and takes the position that there is a correlation between size and performance of a firm. Basing the workings on Lerner Index, the proponent thinks that a firm has an ability to move its prices higher than the marginal cost, and this ability is referred to as the market power. However, the Lerner measure of market power has some assumptions that the banking industry violates, among them being their level of information asymmetry (Lin, 2013).

Market power overview was firm brought about by “structure-behavior- performance (SCP) paradigm by Bain, (1956). This theory shows that firms will strategically position themselves for bigger performances by enhancing their market base, which eventually improves their strategic future performance, meaning a strategic win against their competitors (Nkegbe & Yazidu, 2015).

The Ansoff Matrix of Growth

Business growth is one of the key strategic areas that critical towards moving a business towards a successful future. Igor Ansoff (1957) introduced this matrix that show how companies grow. According to this matrix, there are a number of growth strategies employed by firms, such as market penetration, product development, market development and diversification. In the recent past, Commercial banks have grown tremendous by embracing information and communication technology. They have also adopted diversification. Some of them have adopted horizontal diversification by focusing more on products in line with financial service provision such as insurance (Nkegbe & Yazidu, 2015).

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2. CONCEPTUAL FRAMEWORK

Independent variables are the variables which affect other variables to change and the researcher has control over them. The following conceptual framework was developed for the purpose of this study. The dependent variable (Financial performance) was measured by using financial ratio which is the Return on Assets.

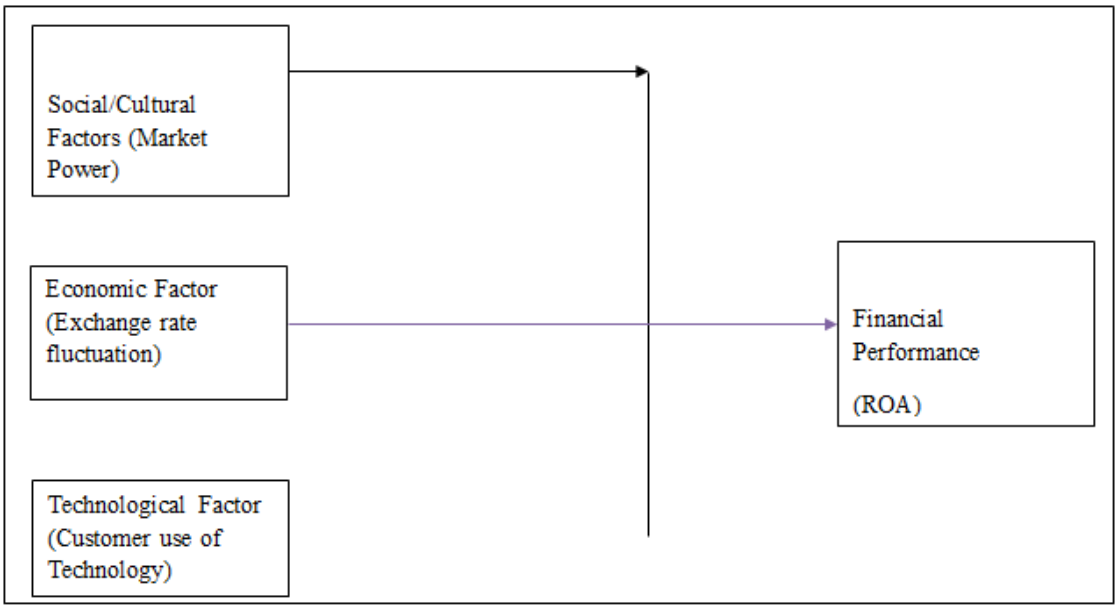

Figure 1: Conceptual Framework

Empirical Review

Empirical Review on Economic Factor on financial performance.

Khalid and Kawai (2013) used monthly data for the period between 1997 and 2010 in India. The empirical results showed a bidirectional long-run causality in Bangladesh and Sri Lanka. No significant relationship was found for Pakistan and India.

Uddin and Alam (2014) examine banks listed in the Dhaka Stock Exchange (DSE) using data from both developed and developing countries. In overall, the theoretical argument of negative relationship between profitability and prevailing economic factors was not rejected. Individual country results were mixed for both developed and developing countries. Eight countries like, Australia, Canada, Chile, Germany, Jamaica, Mexico, Spain, and Venezuela had significant but negative relationship between economic factors and profitability.

Charles et al (2016) determine whether the movement in exchange rates have an effect on the profitability using monthly data for the period between 2010 and 2016 where they found a positive relationship on the long run in the short run respectively.

Empirical Review on Impact of Technology use on financial performance.

Juma (2012) while investigating the ICT adoption impact found that there was a positive correlation where commercial banks that embraced ICT were found to have a higher growth in both market share and profitability.

Muyoka (2014) compared e-banking with performance of Kenya banking system found that relationship between e-banking and bank performance that is strong and positive. However, the study did not holistically cover all forms of branchless banking such as mobile and agency banking.

Mwangi (2014) found that mobile banking was extremely useful as a diversifying strategy among banks. This is because banks used mobile banks to expand geographical coverage and promote their products and services because they provide time savings and they are more efficient than brick and mortar branches.

Liang (2016) found that mobile banking has facilitated the delivery of financial services to population which was previously excluded from the economic conditions of these individuals and improvement in their financial performance which had the commercial banks reap the benefit of their outreach to them through improved financial performance. The study did not establish the individual effect of the various technological innovative strategies.

Empirical Review on Impact of Social Cultural Factor on financial performance.

Delis and Tsionas (2009) use the Panzar and Rosse model and the local regression methodology to compute bank efficiency and the market power of individual banks jointly using time-series data between 2000 and 2008 and conclude both that certain banks do not engage in competitive behavior and that individual bank efficiency and market power are negatively correlated.

Delis (2012) use the Panzar and Rosse model and the local regression methodology to examines banking competition at the bank level using time-series data between 2000 and 2010 and demonstrates that financial reforms that seek to improve banking competition and the efficiency of banking markets require a certain level of institutional maturity to be effective.

Chirwa (2013) examined the relationship between market power and bank profitability in Malawi using time-series data between 1990- 2010. The study findings supported the traditional collusion hypothesis.

Mirzaei et al. (2013) examine the effects of market structure on profitability in banking from emerging economies and advanced economies separately.

3. RESEARCH METHODOLOGY

The research design that was employed is descriptive design. This research was based on secondary data obtained from various sources including the banks' annual published financial reports from year 2013 to 2017.Quantitative data was analyzed using various econometrics models to examine the effects of independent on dependent variables. STATA Version 12.0, an econometric Statistical Package, was used. The results obtained from this model were presented in regression tables to aid in the analysis after which the inferential statistics was drawn. The Johansen's test was used to assess whether any long term correlation existed among the variables: the Market Share Index, Exchange rate fluctuation and Bank Customer use of Technology. The researcher then developed a VECM model. The researcher applied VECM (after regression analysis (OLS,) became inappropriate after some of the assumptions were violated).

Model

The study used the following model:

ROA = *f* (social-cultural, economic and technological factors) …… (Eqn 1)

The log and operational form of the model is thus:

$Y\ (ROA) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$…….…… (Eqn 2)

Where: Y = ROA; a measure of profitability computed as

$$ROA = \frac{\text{Net Income}}{\text{Average Total Assets}}$$

β_0= Constant Term; β_1, β_2, β_3, β_4 = Beta coefficients;

X_1= the Social/Cultural, as measured by Market Share Index that represents the Market Power

X_2= the Economic Factors; as measured by Exchange rate fluctuation

X_3= the Technological Factors; as measured by Value of Non Branch transactions showing Customer use of Technology

ε = Error term

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4. RESULTS

Descriptive Statistics

Histograms were used to check for normality. The research expected that the variances in the data are normally distributed. After performing a Jarque Bela test of the residuals, the research shows that the data is normal. i.

Table 4.1: Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
marketpower	55	6.460909	3.122633	1.55	13.88
exchangera~n	55	.2450909	.1554786	.04	.71
useofteckn~y	55	.4770909	.1211927	.31	.69
roa	55	.5143636	.1115839	.3	.7

Post Estimation Diagnostics

The ordinary Least Squares (OLS) model is deemed to be adequate only if certain assumptions are not violated (Gujarati, 2003). These assumptions are as follows; residuals are random, normally distributed, homoscedastic and are not serially correlated. The researcher used visual aids, as well as, specific tests to confirm that these assumptions are not violated.

The histogram in Figure 2 in Appendix iv demonstrates that residuals are approximately normally distributed. This is clearly indicated by the normal and Kernel densities fitted on the histogram. The residuals are plotted against fitted values to assess their randomness. The researcher did the Breusch –Pagan/ Cook-Weisberg test to detect any linear form of heteroscedasticity. Evidence of heteroscedasticity was not noted.

The researcher tested serial autocorrelation in residuals as the other key assumption. The researcher performed the Durbin-Watson d-statistic and obtain the result of (4, 55) = 2.328439 .It is concluded that there is no problem of serial autocorrelation. The normality of the residuals results are given in Table 2 Appendix IV, it is concluded that the residuals are not normally distributed. This is further assessed by use of the normality histogram, which cements this conclusion.

OLS further assumes that there is no multi-collinearity among variables as shown in Table 7 in Appendix IV. The problem of multi-collinearity is usually indicated by high (>0.8) among the variables. Using the Variance Inflation Factor (VIF) method, the results in Table 6 in Appendix IV shows that the mean VIF is equal to 1.19 which shows that there's no multi-collinearity.

Time Series Analysis

The researcher did stationarity assessment under several tests among them; correlograms, Augmented Dickey Fuller (ADF) and Philips-Perron (PP) tests.

Testing for Stationarity

Figure 4 of Appendix V shows the contrasts of correlograms of the data before and after differencing the data once. It was noted that the data under the study was slightly non-stationary before first differencing. The researcher confirms this by performing the ADF and PP tests. The results before and after differencing are shown in Table 4.2.

Table 4.2: Unit Root tests

Unit Root Test										
	Augmented Dickey-Fuller Test Statistic						Phillips-Perron Test Statistic			
	Null Hypothesis: Variable is Non Stationary						Null Hypothesis: Variable is Non Stationary			
	Level			First Difference			Level		First Difference	
	Pure Random Walk	Random With a Trend	Random With a Drift	Pure Random Walk	Random With a Trend	Random With a Drift	Pure Random Walk	Random With a Trend	Pure Random Walk	Random With a Trend
ROA	-5.864	-9.067	-9.098	-15.265	-15.102	-15.324	-5.978	-9.072	-20.812	-20.377
M Power	-1.745	-8.096	-8.136	-12.518	-12.375	-12.429	-1.183	-8.125	-16.192	-15.867
ExFluct	-5.659	-7.777	-7.659	-14.855	-14.765	-14.138	-5.596	-7.715	-16.951	-16.965
Uo Tech	-1.568	-9.167	-8.814	-13.69	-13.492	-13.591	-0.999	-9.302	-21.472	-21.018
Test Critical Values (MacKinnon, 1996)										
1%	-2.631	-4.214	-2.423	-2.612	-4.106	-2.382	-2.612	-4.104	-2.612	-4.106
5%	-195	-3.528	-1.684	-1.95	-3.48	-1.668	-1.95	-3.479	-1.95	-3.48
10%	-1.607	-3.197	-1.303	-1.61	-3.168	-1.294	-1.61	-3.167	-1.61	-3.168

Phillips and Perron's test statistics is Dickey–Fuller statistics made robust to serial correlation. This finding is consistent with the earlier observation that most economic data are integrated of order one I (1). With this condition of non-stationarity, then researcher had to find an appropriate multivariate model for the non-stationary data.

Modeling Cointegrated Systems

It is confirmed, from the test for stationarity, non-stationarity. This makes the OLS model inadequate for modeling. The cointegration analysis becomes the most appropriate framework to help make estimation, inference and interpretation according to (Brooks, 2008).

The researcher uses cointegration on the selected explanatory variables. Now that it's determined that the research data is integrated of order one, cointegrating relationships were confirmed using Johannsen's test.

For the cointegration equations to be modeled, the lag with the lowest AIC, SBIC and HQIC, forms the decision criteria for choosing the appropriate lag, where in this case the lower the value, the better. The output from Stata as presented in Table 4.3 below determines the appropriate lag to be lag three. The researcher, therefore, used three lags for the multivariate model because the Schwarz Bayesian information criterion (SBIC) method, and three other tests all chose three lags, as indicated by the "*" in the output.

Table 4.3: Lag Selection Criteria

```
. varsoc marketpower_d1 exchangerate fluctuation_d1 useoftecknology_d1 roa_d1, maxlag(5)

  Selection-order criteria
  Sample:  7 - 55                              Number of obs      =        49
```

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-53.2412				.000122	2.33638	2.39497	2.49081
1	-29.3568	47.769	16	0.000	.000088	2.01456	2.30753	2.78674
2	10.8277	80.369	16	0.000	.000033	1.02744	1.55477	2.41735
3	43.6655	65.676*	16	0.000	.000017*	.340184*	1.10188*	2.34783*
4	55.7369	24.143	16	0.086	.000022	.500535	1.4966	3.12592
5	67.5897	23.706	16	0.096	.000029	.669807	1.90024	3.91293

```
  Endogenous:  marketpower_d1 exchangerate fluctuation_d1 useoftecknology_d1
               roa_d1
   Exogenous:  _cons
```

After determining the appropriate number of lags to be included in the model as three, the researcher then tested for cointegration based on Johansen's method. This was to confirm the number of cointegrating equations. Johansens' approach (1995) has two tests for cointegration that is the trace and the maximum tests. The trace statistic (λ *trace*) is a joint test where H_0 with cointegrating vectors less than zero or equals to *r* against an unspecified or general alternative that there is more than *r*. The max (λmax) conducts separate tests on each eigenvalue and has H_0 equals cointegrating vectors equal to *r* against the alternative of ($r+1$). The two tests are then obtained. If H_0 fails to get rejected, it is concluded that there are no cointegrating vectors and the testing would be completed. The results are presented in Table 4.4 and Table 4.5 below.

Table 4.4: Cointegration Rank Test (Trace)

```
. vecrank marketpower exchangerate fluctuation useoftecknology roa, trend(constant) lags(3)

                     Johansen tests for cointegration
Trend: constant                                      Number of obs =       52
Sample:  4 - 55                                             Lags =        3
------------------------------------------------------------------------------
                                                           5%
maximum                                          trace     critical
  rank     parms       LL         eigenvalue  statistic     value
    0        36     8.1835569           .       87.4267     47.21
    1        43     28.830827       0.54802     46.1321     29.68
    2        48     40.512429       0.36192     22.7689     15.41
    3        51     50.173451       0.31035      3.4469*     3.76
    4        52     51.896894       0.06414
------------------------------------------------------------------------------
```

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Trace test is also supported by the maximum Eigen Value and the Information Criteria as shown in Tables 4.5 and 4.6; giving 3 co-integrating equations hence rejecting of the hypothesis.

Table 4.5: Maximum Eigen Value

maximum rank	parms	LL	eigenvalue	max statistic	5% critical value
0	36	8.1835569	.	41.2945	27.07
1	43	28.830827	0.54802	23.3632	20.97
2	48	40.512429	0.36192	19.3220	14.07
3	51	50.173451	0.31035	3.4469	3.76
4	52	51.896894	0.06414		

*Max-Eigen value yields the same results.

Table 4.6: Information Criteria

maximum rank	parms	LL	eigenvalue	SBIC	HQIC	AIC
0	36	8.1835569		2.420724	1.587751	1.069863
1	43	28.830827	0.54802	2.158497	1.163557	.5449682
2	48	40.512429	0.36192	2.089132	.9785011	.2879835
3	51	50.173451	0.31035	1.94551*	.7654654*	.0317904
4	52	51.896894	0.06414	1.955209	.7520264	.0039656

Testing Johansens' cointegrating rank enabled the researcher to determine the number of cointegrating equations and thus infer that the VEC model was the most appropriate. The model was based on the lowest FPE, HQIC and SBIC of three lags as demonstrated earlier. The tests indicated that the appropriate lag is three and hence estimating the parameters of a multivariate co-integrating VECM by using VEC. Further, the variables are determined as co-integrating of order 1 for simplicity and thus the VEC model was run as follows:

Table 4.7 Vector Error Correction Model Estimation

Vector error-correction model

Sample: 2 - 55 — No. of obs = 54
AIC = .6150139
Log likelihood = 2.394625 — HQIC = .88491
Det(Sigma_ml) = .0000108 — SBIC = 1.314842

Equation	Parms	RMSE	R-sq	chi2	P>chi2
D_marketpower	4	2.68552	0.3353	25.21847	0.0000
D_exchangerate~n	4	.148764	0.5514	61.46944	0.0000
D_useofteknol~y	4	.107278	0.0576	3.055802	0.5485
D_roa	4	.102266	0.6173	80.65279	0.0000

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
D_roa						
_ce1						
L1.	-.064618	.1483465	-0.44	0.663	-.3553717	.2261357
roa						
LD.	-.7140815	.1830345	-3.90	0.000	-1.072822	-.3553404
L2D.	-.2898564	.1503551	-1.93	0.054	-.5845469	.0048341
marketpower						
LD.	-.0083836	.0094451	-0.89	0.375	-.0268957	.0101285
L2D.	.0020802	.0077237	0.27	0.788	-.013058	.0172184
exchangeratefluctuation						
LD.	-.0427701	.1725064	-0.25	0.804	-.3808765	.2953363
L2D.	.0132012	.1228041	0.11	0.914	-.2274904	.2538928
useofteckнology						
LD.	.2909898	.1953105	1.49	0.136	-.0918118	.6737915
L2D.	.2487691	.1940541	1.28	0.200	-.1315699	.6291081
_cons	-.0111073	.0178365	-0.62	0.533	-.0460661	.0238516
D_marketpower						
_ce1						
L1.	9.687751	2.913758	3.32	0.001	3.976891	15.39861
roa						
LD.	-6.873654	3.595085	-1.91	0.056	-13.91989	.1725832
L2D.	-1.641793	2.95321	-0.56	0.578	-7.429978	4.146391
marketpower						
LD.	.3845806	.1855168	2.07	0.038	.0209743	.748187
L2D.	.3898108	.1517061	2.57	0.010	.0924724	.6871492
exchangeratefluctuation						
LD.	12.09856	3.388297	3.57	0.000	5.457616	18.7395
L2D.	14.92434	2.412066	6.19	0.000	10.19677	19.6519
useofteckнology						
LD.	-1.151998	3.836206	-0.30	0.764	-8.670823	6.366827
L2D.	-9.981852	3.811527	-2.62	0.009	-17.45231	-2.511396
_cons	-.0008697	.3503361	-0.00	0.998	-.6875158	.6857764

D_exchangeratefluctuat~n						
_ce1						
L1.	.6613539	.1735813	3.81	0.000	.3211408	1.001567
roa						
LD.	-.6077305	.21417	-2.84	0.005	-1.027496	-.187965
L2D.	-.4658599	.1759316	-2.65	0.008	-.8106795	-.1210404
marketpower						
LD.	.0146057	.0110518	1.32	0.186	-.0070554	.0362668
L2D.	-.0137158	.0090376	-1.52	0.129	-.0314292	.0039975
exchangeratefluctuation						
LD.	-.0091997	.2018511	-0.05	0.964	-.4048205	.3864211
L2D.	-.275356	.143694	-1.92	0.055	-.556991	.0062791
useofteckнology						
LD.	-.0878477	.2285343	-0.38	0.701	-.5357667	.3600713
L2D.	.0574518	.2270641	0.25	0.800	-.3875857	.5024893
_cons	.0058129	.0208706	0.28	0.781	-.0350927	.0467184
D_useofteckнology						
_ce1						
L1.	-.2252809	.0907091	-2.48	0.013	-.4030674	-.0474944
roa						
LD.	.0804284	.1119197	0.72	0.472	-.1389301	.2997869
L2D.	-.0976617	.0919373	-1.06	0.288	-.2778554	.082532
marketpower						
LD.	-.0203879	.0057754	-3.53	0.000	-.0317075	-.0090684
L2D.	-.0240533	.0047228	-5.09	0.000	-.0333098	-.0147967
exchangeratefluctuation						
LD.	-.2888815	.1054821	-2.74	0.006	-.4956226	-.0821404
L2D.	-.2327582	.0750907	-3.10	0.002	-.3799333	-.085583
useofteckнology						
LD.	-.6371109	.1194261	-5.33	0.000	-.8711817	-.4030401
L2D.	-.3839694	.1186578	-3.24	0.001	-.6165344	-.1514044
_cons	-.0171496	.0109064	-1.57	0.116	-.0385258	.0042266

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```
Cointegrating equations

Equation           Parms     chi2      P>chi2
------------------------------------------------
_ce1                   3    48.47049   0.0000
------------------------------------------------
```

```
                Johansen normalization restriction imposed
------------------------------------------------------------------------------
        beta |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
_ce1         |
         roa |          1          .       .       .            .           .
marketpower |   -.062523   .0095685    -6.53   0.000    -.081277   -.0437691
exchangerat~n |  -1.553289   .2964031    -5.24   0.000    -2.134228   -.9723492
useoftecknology |   .1948494   .1884183     1.03   0.301    -.1744436    .5641425
       _cons |   .1493917          .       .       .            .           .
------------------------------------------------------------------------------
```

In the D_roa equation, the ce1_ L1 term is insignificantly negative (-.064618 with a pvalue of 0.663) representing the weak but negative feedback necessary in ROA to bring the other variables back to equilibrium. The short-run coefficients in this equation are not significantly different from zero. This adjustment term is statistically insignificant but can be interpreted to mean that the previous year's errors (deviation from the long run equilibrium) may be corrected within the current year within a speed of 6.46%.

In the D_Market power equation, and D_Use of technology the lagged ECT is positive. In the D_exchange fluctuation equation is negative, with all being significant. This meets the expectation as it must be for the other variable in the relationship: that is, if (log p − log e) is above long-run equilibrium, either p must fall or e must rise. The use of technology valuable has a P value of 0.301. as per the Johansen Test. This makes it non-significant in the model and thus is dropped.

With the researcher being satisfied, it was summarized as below:

Table 4.8: VEC Model normalized equation

	ROA	**Market Power**	**Exchange Rate Fluctuation**
ECT	1	.062523	1.553289
S.E		.0095685	.2964031
T Values		-6.53	.1884183
P Values		0.000	0.000

The normalized equation was therefore estimated as below:

$$\textbf{ROA} = 0.1493917 + 0.062523\ \textbf{Market Power}_t + 1.553289\ \textbf{Exchange Rate Fluctuation}_t$$

It can be observed from table 4.9 that the lagged error correction terms the y variables are significant and in the same direction.

Fitting VECM with Johansens' Normalization- Long Term Model

The researcher finally runs the VEC model as above while applying restrictions as argued by Johansen. The maximum numbers of lags are 3 and the rank is one as obtained earlier. The output is as shown in table 4.9 above;

The cointegrating equation can be expressed as;

$$\textbf{ROA}_t = 0.1493917 + 0.062523\ \textbf{Market Power}_t + 1.553289\ \textbf{Exchange Rate Fluctuation}_t$$

(0.000)* (0.000)*

Where ()* indicates the p values

From the output above, it's observed that **ROA_t** is positively cointegrated both the variables **Market $Power_t$** as well as **Exchange Rate $Fluctuation_t$** with the coefficients being statistically significant at 5%. This is to say that any unit change in the **Market $Power_t$** and **Exchange Rate $Fluctuation_t$** leads to an increase of **0.062523 and 1.553289** in ROA respectively.

Post estimation specification testing – Stability Test

As a post estimation test, the researcher concluded that the model may be slightly mis-specified.

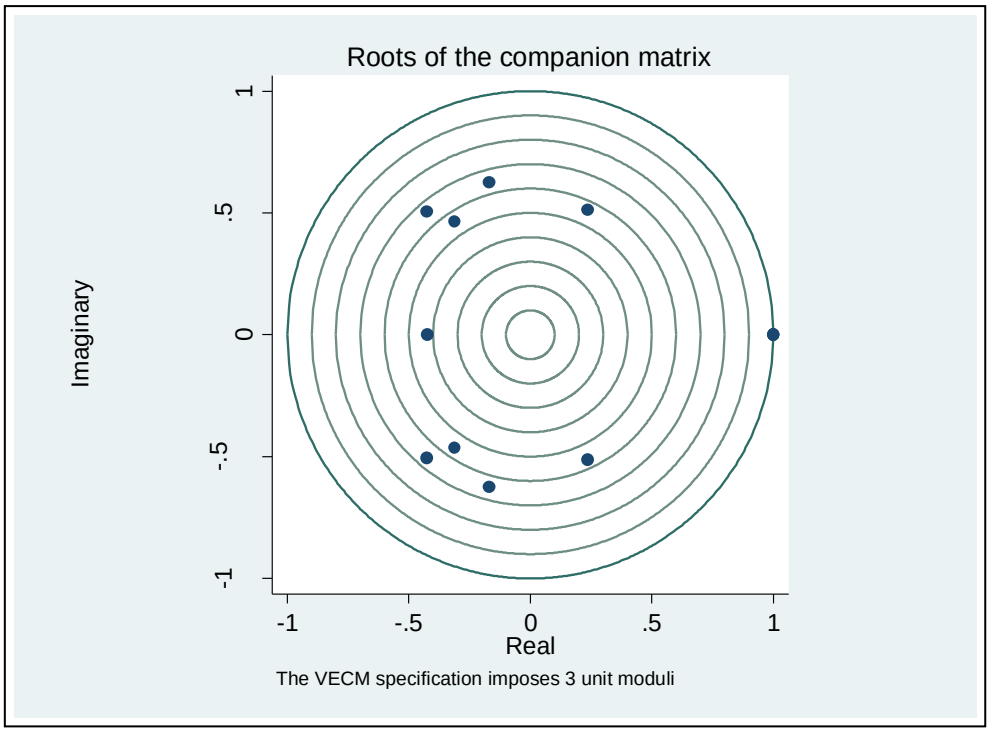
Stability Test

Eigenvalue stability condition

Eigenvalue	Modulus
1	1
1	1
1	1
.3757275 + .717103*i*	.809573
.3757275 - .717103*i*	.809573
-.3439271 + .6915056*i*	.772312
-.3439271 - .6915056*i*	.772312
-.6500017 + .3597996*i*	.742939
-.6500017 - .3597996*i*	.742939
-.09046595 + .5386896*i*	.546233
-.09046595 - .5386896*i*	.546233
-.2999719	.299972

The VECM specification imposes 3 unit moduli.

The model does not appear mis-specified in the graphical representation.



Lagrange Multiplier Test

```
. veclmar, mlag(3)

  Lagrange-multiplier test
```

lag	chi2	df	Prob > chi2
1	19.4403	16	0.24649
2	28.0459	16	0.03122
3	23.5268	16	0.10036

```
  H0: no autocorrelation at lag order
```

There is no serial autocorrelation in lag one and three but there is in lag of order two. This is because the P Value is high in lag 1 and 3, meaning that the Ho is not rejected.

Conclusion

The researcher finds a strong correlation between the factors and the banks' Returns on Assets with economic factor having the highest value and use of technology having no correlation value. From the VEC model, the following equation was formulated;

$$\mathbf{ROA_t = 0.1493917 + 0.062523\ Market\ Power_t + 1.553289\ Exchange\ Rate\ Fluctuation_t}$$

From the equation above, it's observed that **ROA_t** is positively cointegrated with **Market Power$_t$** and **Exchange Rate Fluctuation$_t$** with the coefficients being statistically significant at 5%. This means that any unit change in the **Market Power$_t$** and **Exchange Rate Fluctuation$_t$** leads to an increase of 0.062523 and 1.553289 respectively in ROA. These two variables are therefore significant in explaining long term Return on Assets changes for Commercial Banks in Kenya.

The Study Limitations

The study relied on secondary data sources. Secondary data can, however, be unreliable as it is intended for other purposes. Some relevant information was not easily accessible and hence the researcher had to use the goodwill of friends to obtain such data. The focus of the study was only on commercial banks in the NSE list.

Further Studies

The variables were not exhaustive. Future research could incorporate other variables such as political and legal and factors. The study recommends use of similar factors as this research work but covering a longer period such as pre and post constitutional change in Kenya.

REFERENCES

[1] Adnan, T. (2012).The impact of assets quality management on profitability and shareholders' value - the Case of Jordanian Listed Commercial Banks (2001 - 2012)

[2] Ahmad, N.H., and Ariff, M. (2013). "Multi-country study of bank`s credit risk determinants".

[3] Akinlo, A.E. (2012). Firm Size-Profitability Nexus: Evidence from Panel Data for Nigeria, Economic ResearchEkonomska Istraživanja, 25(3), pp. 706-721

[4] Al-Sabbagh, N. (2004). Determinants of capital adequacy ratio in Jordanian and Evidence. *Journal of Monetary Economics, 32*

[5] Charles,A.,Simon H. and Agyapong ,D.(2016); Effects of exchange rate volatility on the Ghana commercial bank profitability, *African Journal of Accounting ,Finance and Banking Research* vol.3(3),28-47.

[6] Chirwa, E.W. (2013). Determinants of commercial banks' profitability in Malawi: A co -integration analysis. Applied Financial Economics, 13, (8), 565-571.

[7] Delis, M. D., Kouretas, G. P., 2011. Interest rates and bank risk-taking. Journal of Banking & Finance 35 (4), 840–855

[8] Delis, M. D., 2012. Bank competition, financial reform, and institutions: The importance of being developed. *Journal of Development Economics* 97 (2), 450–465.

[9] Dogan, M. (2013). Does firm size affect the firm profitability? Evidence from Turkey, *Research Journal of Finance and Accounting, 4(4), pp. 53-59*

[10] González, V.; González, F. 2012. Firm size and capital structure: evidence using dynamic panel data, *Applied Economics* 44: 4745–4754.

[11] Greuning, H.; Bratanovic, S. B. (2003) Analyzing and Managing Banking Risk. A Framework for Assessing Corporate Governance and Financial Risks. 2nd edition. The World Bank, Washington, D. C

[12] Howells, P. & Keith, B. (2008). The Economics of Money, Banking and Finance. Pearson Education Ltd. 4th Edition

[13] Jenkinson, N. (2008), "*Strengthening regimes for controlling liquidity risk*", Euro Money Conference on Liquidity and Funding Risk Management, Bank of England, London, p. 9.

[14] Juma, W. (2012). The impact of ICT adoption on growth of Commercial banks in Kenya, unpublished MBA project, University of Nairobi

[15] Kamau, G.B (2014). Bank capitalization and performance in Kenyan banking industry (2000-2012): empirical evidence

[16] Kannadhasan, M. and Nandagopal , R. (2009). Firm Size as a Moderator of the relationship Between Business Strategy and Performance in Indian automotive Industry. *Srusti Management Review 2(2) 4- 15*

[17] Kieschnick.R, LaPlante.M & Moussawi.R. (2016), Liquidity management, agency costs, and profitability, Macmillan publishers, USA., pp: 550-644.

[18] Khalid and Kawai (2013), Was Financial market contagion the source of economic crisis in Asia? Evidence using a multivariate model . Journal of Asian economies 14(1) ,131 -156.

[19] Kothari C.R. (2004). Research Methodology, Methods and Techniques, 2nd ed. New Delhi: New Age International Ltd

[20] Liang, J. & Lu, M. (2016) Technology acceptance model for wireless internet, Internet Research: Electronic Networking Applications and Policy, (13)3, 206-222

[21] Mintzberg, H. (1987) The Strategy Concept 1: Five Ps for strategy. *California Management Review* (June 1987)

[22] Mirzaei, A. (2012). The Effect of Market Power on Stability and Performance of Islamic and Conventional Banks. *Islamic Economic Studies*, 18 (1 & 2), 45-81

[23] Mirzaei, A., Moore T., Liu, G., 2013, Does market power matter on banks' profitability and stability? Emerging vs. advanced economies

[24] Muyoka, C. (2014). Mobile banking and financial performance in Kenya, Unpublished project, University of Nairobi

[25] Nkegbe, P. K. & Yazidu, U. (2015). Banks Performance in Ghana: Trends and Determinants. *Global Journal of Development Studies*, 12 (1&2), 33-52

[26] Obadan, M. (2004), "Mergers and Acquisition and the new Minimum Capital", *Financial Standard*, Vol. September, No. 6, pp. 34.

[27] Ramalho, J.; Silva, J. 2009. A two-part fractional regression model for the financial leverage decisions of micro, small, medium and large firms, *Quantitative Finance* 9: 621–636.

[28] Reynolds, SE and Ratanakomut, SG (2000), "Bank Financial Structure in Pre-crisis East and South East Asia", *Journal of Asian Economy, Vol. 11, No. 3, pp. 319-331.*

[29] Uddin, M. & Alam, M. (2014). "The Impacts of Exchange rate Rate on profitability of listed commercial banks: Empirical Evidence from Dhaka Stock Exchange". *South Asian Journal of Management and Science*s.

[30] Vijayakumar, A. and Tamizhselvan, P. (2010), "Corporate Size and Profitability-An Empirical Analysis", College Sadhana – *Journal for Bloomers of Research, Vol. 3, No. 1, pp. 44 – 53*