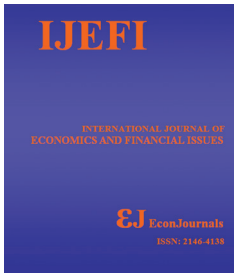

International Journal of Economics and Financial Issues

ISSN: 2146-4138

available at http: www.econjournals.com

International Journal of Economics and Financial Issues, 2017, 7(1), 340-350.

Kenya Commercial Banks are Star Performers: Myth or Truth? Exploratory Empirical Evidence from Nairobi Securities Exchange

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ABSTRACT

The profitability of commercial banks in Kenya has been a subject of intense policy debate over the past two decades. This paper explores and adduces evidence that the perceived abnormal profitability in the industry is reflected in stock returns. The study utilizes time series data obtained from the NSE and five macroeconomic variables for the period 1996: 2015. We regress portfolio monthly excess returns, predict and graph these returns to determine if the banking sector outperforms other sectors of the economy. The empirical evidence presented here suggests that the banking industry outperforms other sectors of the economy in Kenya.

Keywords: Commercial Banks, Evidence, Portfolio Returns
JEL Classifications: A23, C22, E44

1. INTRODUCTION

Ever since the early 1990s, it has been argued that the Kenyan banking sector is the most profitable within the Kenyan economy, recording what is obviously considered as "abnormal profits" based on reported nominal before tax profits. Kamau and Were (2013) report that the industry profits have grown by about 400% over the period between 1997 and 2013, despite the economy performing very poorly in certain years over the period, the 2008/2009 global economic crises and the post-election violence after the 2007 general elections. From their statistics, nominal before tax profits grew from Kenya Shilling (KES) 18.8 billion (US$ 0.188 billion under current exchange rates [EXR]) in 1997 to KES 89.2 billion (US$ 0.892 billion) in 2011, representing a 2.7% (from 0.3% to 3.0%) growth in share of gross domestic product (GDP). Similarly, the industry asset and deposits bases grew phenomenally over the period to cross the psychological KES 1 trillion and stand at 67% and 49% of the GDP respectively by end of 2011.

These unusually high profit returns have been the subject of heated debates among policy makers, politicians, economist and other professionals, civil society groups and the consumer federation in Kenya. The big question at the center of the debate has been on how to explain the mind boggling numbers emanating from the financial reports of the commercial banks, especially the so called "the big 5" (KCB bank, Barclays bank, Standard and Chatered bank, Equity bank and Cooperative Bank) when contextualized within the economic environment in which they operate and nominal profitability as reported by other sectors of the economy. A more fundamental question is whether these sentiments of abnormal profitability in the banking sector is reflected on the stock returns for the listed commercial banks at the NSE.

This study tests whether an industry portfolio return for all listed commercial banks outperforms other industry portfolio returns for the period April 1996: December 2015. A single portfolio is created for each industry/sector based on the NSE current classifications to form a total of 10 portfolios. Daily trading data has been obtained from the NSE for the period 1995:2015, while the monthly NSE 20 share index weighted values and monthly consumer price index (CPI) values have been obtained from monthly economic indicator reports available at the Kenya National Bureau of

Statistics (KNBS) website. Other macroeconomic data series including money supply (MS), EXR, 91 day Average treasury bill rates (ATB) - short term interest rates, commercial banks weighted lending rates and interbank rates are obtained from the Central Bank of Kenya (CBK) website. The interbank rates (proxy for short term interest rates) are subtracted from the commercial bank lending rates (proxy for long term interest rates) to compute the credit spreads (CS).

A simple weighted average method is used to compute the portfolio return for each industry. The portfolio excess returns are first regressed under the capital asset pricing model (CAPM) to determine its validity in the emerging market of Kenya. A multifactor model then extends the CAPM model by adding 5 macroeconomic variables to the regression. After regression, the excess returns for each portfolio are predicted and plotted against that of the banking sector to determine if the banking industry outperforms the other industries on average.

The portfolio weighted average returns indicates that telecommunications and technology industry has the highest average return at 2.12%, followed by investment and services and manufacturing and allied with 1.45% and 1.28% respectively. The banking industry is fourth with a return of 1.08% while energy and petroleum has the least average returns at −0.02%. However, from the CAPM regression, the banking portfolio has the highest beta (β) for the market factor at 1.03, followed by telecommunications and technology and insurance sectors at 1.018 and 1.007 respectively. The agriculture sector has the lowest β at 0.823.

The CAPM regressions results indicate that the constants are insignificant from zero for seven out of the ten portfolios. It's only weakly significant for agriculture, banking and telecommunications and technology industries. This suggests that we cannot reject its validity in the emerging market of Kenya. From the multifactor model, the βs for the market factor are all significant at the 1% confidence level for the 10 portfolios. The Banking sector β remains the highest at 1.023 with the Insurance following at 1.007. The Agriculture sector β remains the least at 0.816. The βs for the macro-variables are largely insignificant across most of the portfolios.

The predicted portfolio excess returns graphed against that of the banking sector indicates that the banking sector portfolio outperforms all other sectors except for the insurance sector that seems to move together. Thus, the study concludes that the abnormal profits sentiments, for the banking sector has been priced in their stock returns at the NSE. The fact that these public sentiments have been priced in the stock market could suggest the NSE is at least in the semi-strong form of market efficiency.

This study makes three key contributions to the body of knowledge. First, it has validated the ever growing belief that commercial banks in Kenya earn "abnormal returns" with evidence from the stock market. If it's true that the banking industry enjoys superior returns compared to other sectors of the economy, then we would expect rational wealth maximizing investors to use this information to earn superior returns from the stock markets. Based on the efficiency market hypothesis, stock market can be taken as good predictors of investor beliefs as they would seek to exploit available information to grow their wealth. The study findings adduces objective evidence to this superior performance of the banking industry in Kenya and could inform policy debate henceforth.

Secondly, the study proffers more insights into the scanty literature available from stock markets in less developed and developing countries. While a lot of literature exists about developed and emerging markets of the western, east and other Asian economies, little is known and/or documented from less developed and developing markets, especially from Sub-Saharan Africa. The fact that very little literature exists about these markets does not mean that such markets do not exist or do not provide opportunities for wealth seeking investors.

In fact, i would hypothesize that such markets offer unique opportunities for risk diversification since these markets are not fully/tightly linked with well known and developed international markets. A ray of evidence of the existing potential in these markets, and Sub-Saharan Africa in particular, could be traced to the recent successful sovereign bond issues by Ghana (2012) and Kenya in 2014 at the international markets. In each of both cases, the two countries raised US$1 billion from the international market, the bonds being over-subscribed by over 100%. Kenyan tapped the international market for an additional US$ 750 million in the 2nd quarter of the 2014/15 financial year, and again the bond tap was over-subscribed by over 100%.

Finally, this study will contribute to the existing academic literature and body of knowledge. It is hoped that the study findings shades more light about Sub-Saharan Africa capital markets and open the region for further studies in the coming years. This provides students of finance and economics with more information about an otherwise little known part of the global financial/capital markets. It creates a window of opportunity for further studies.

The rest of the paper is organized as follows: Part 2 discusses the relevant literature and part 3 describes the sources of data. Part 4 discusses the identification strategy with the main results presented and discussed in part 5. In part 6 we conclude and proffer a limitation of the study.

2. RELEVANT LITERATURE

2.1. Background Information

Over the years, the superior profitability debate of the Kenyan banking sector has narrowed to their interest incomes, which constitute the major source of revenue for the banking industry. It's without a doubt that Kenya has one of the highest interest rates spreads among its economic peers. For instance, data from a presentation by the Institute of Economic Affairs (IEA) at a public forum in February 18, 2014, indicate that commercial banks weighted lending interest rates averaged at 22% to 17% for the period between April 2012 and December 2013, with weighted interest rates on savings remaining at about 8-6%. Over this period, the interbank interest rates, 91 day Treasury bill rates and Central

Bank Rate (CBR) averaged 9.67, 9.62 and 11.45 respectively (computed from CBK data).

The CBR was introduced in June 2006, and acts as the bench mark risk free rate. However, it has now been replaced by the Kenya Banks Reference Rate (KBRR), to be computed as an average between CBR and the weighted 2 month moving average of the 91 day treasury bill rates. The rate is set by the Monetary Policy Committee and came into effect on July 1, 2014. It was initially set at 9.13% (Ojiambo, 2014), and reviewed downwards to 8.54% in January 2015. However, due to macro-economic instability in the country for most part of 2015 the rate was reviewed upwards by 1.33 basis points to 9.87% in July 2015, in an effort to tighten MS and stabilize the KES against the US$. In July 25, 2016, it was adjusted downwards to the current rate of 8.90%. KBRR is an outcome of a consultative process led by industry stake holders, the CBK and the national treasury with the main objective as to tackle the problems of high interest rates in Kenya, by bringing stability and predictability to the base rate.

2.2. The Macroeconomic Environment vs. Banking Profitability in Kenya

Ndung'u and Ngugi (2000) argue that the banking sector interest rate spread (IRS) is among the most controversial post liberalization macroeconomic phenomenon in Kenya. While they appreciate that many factors including market structure (internal organization) of the sector, management and regulatory framework play a key role in determining IRS, they conclude that the absence of macroeconomic stability is an important trigger factor of a chain of variables that can explain the spreads in the Kenyan case. One of these variables has been the consistently high budget deficits that the government often and largely finances with short term domestic borrowing, sometimes at very high interest rates. This offers the Kenyan commercial banks a safe investment opportunity with a high return at the risk free rates.

IEA (2000) opines that the government is trapped in a debt cycle, often borrowing short term at high interest rates to repay maturing obligations. As a consequence, Treasury bill rates that for a long period have served as the risk free/base rate (and currently still a key component in determination of the base rates) has remained unacceptably high. The high risk free government borrowing rates provides safe havens for banks to lend at no (or very low) risk, crowds out credit seeking private sector organization and individual borrowers. Furthermore, high government borrowing increases demand for available credit reserves from surplus spending units, with the obvious consequence being an increase in the price for money given the simple economic logic of the forces of demand and supply.

Another unintended consequence of the high borrowing rates by the government is the fact that the upward pressure on the cost of credit keeps away potential high credit worth borrowers. Assuming diligent and high credit worth borrowers (mainly the corporate sector) are rational, they will obviously keep away from borrowing from the commercial banks if they perceive the cost of debt to be unjustifiably high. That leaves the market littered with high risk borrowers (mainly individual borrowers). Obliviously therefore, faced with a large pool of high risk borrowers, whose credit worthiness cannot be reliably determined and considering the high unit cost of collecting credit information for individual borrowers, the banks will of necessity set a high general minimum interest rates for this class of borrowers. The net cumulative effect is a general high interest rate regime and wide spreads. Based on an analysis of Ndung'u and Ngugi (2000) report, IEA concludes that the high interest spreads in Kenya cannot be attributed entirely to the bank's avarice, but are symbolic of a wider problem of failure on the part the regulatory authorities.

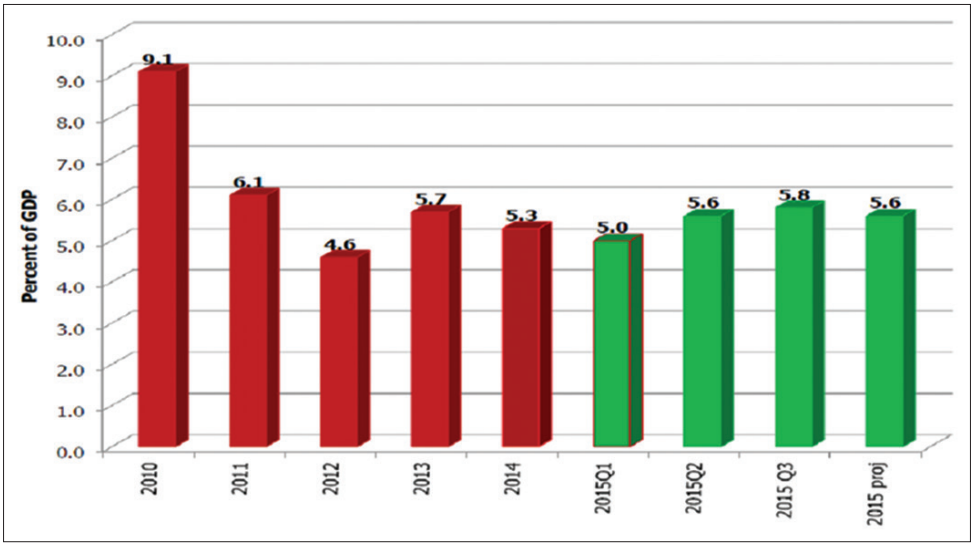
Kamau and Were (2013) using structure conduct process analysis find that the superior performance in the Kenyan banking sector is not as a result of improved efficiency or leverage on recent technologies heavily employed by the commercial banks in their operations, but it's as a result of structure/collusive power. They argue that high concentration/market power explains the abnormal profitability in the banking sector. This implies that collusion among the big banks that control a significant portion of the market allows them power to control/dictate interest rates, ignoring policy signals to reduce their lending rates, and in the process reap huge profits despite glaring inefficiencies in their operations.

The political class, often picking cue from the consumer federation, civil society groups and the media in every financial reporting cycle, have attempted to control interest rates through legislation. The first boldest attempt was in 2000, with the introduction of the Central Bank (Amendment) Act 2000 (famously referred to as the Donde Bill, after the Member of Parliament behind it). The bill had proposed to cap IRS at 6% (lending rates to be pegged at 3% above the average previous months T. Bill rates and interest on savings at 3% below the average previous T. Bill rates). However, at the passing of the amendments on November 29, 2000, a compromise was arrived at that increased the peg to 4% on either side, thus increasing the spread to 8%. The Amendments were, however, challenged in court by the banking sector and never came into effect. This position was strengthened by external pressure from the International Monetary Fund arguing against interest rates control, and terming them as retrogressive and likely to erode the gains achieved in liberalizing the Kenyan financial sector.

If we contextualize the high cost of credit in the country within the wider national long term economic development blue print (the Vision 2030), then it would be clearer why the government is particularly concerned. Under the Vision 2030, it is projected that if the country is to attain the middle income country status, the overarching goal of the 25 year plan, the economy must, as of necessity grow at a sustained rate of 10% from the year 2012. This growth rate has not been achieved, with the economy growing at a paltry 4.6% in 2013, 5.3% in 2014 and 5.5% in 2015 as shown in Figure 1. It is projected to remain at below 7% through 2017.

The attempts to regulated interest rates in Kenya succeeded in July 2016 with the passing of the Central Bank (Amendment) Act 2016 and signed by the president in August 2016. The new regulation caps lending interest rates at 4% above the base rate and savings rates at 70% of the base rate. Since the coming into effect of the new regulations, there has been divided opinion

Figure 1: Economic growth in Kenya 2010-2015



Source: Kenya National Bureau of Statistics

on their implications to the economy. The banks have argued that this would lead to crowding out of low income earners who cannot borrow within the caps (due to their higher risk profile). Some analysts argue that this is good news to the middle class and small and medium enterprises in Kenya that can now access credit at affordable rates to invest back into the economy. However, what is in no doubt is that the new interest rate regime will eat into the high profitability currently enjoyed by the banking industry.

While it requires no rocket science to understand that high interest rates spreads stifles investments, discourages savings, slows down economic growth and ultimately negatively impact on people's welfare, the ultimate impact of this regulations remain uncertain. First, the government continues to run a very high budget deficit, with domestic debt accounting for about 55% of the national debt estimated at KES. 3.3 trillion in March 2016. This makes the government a key consumer in the local credit market, still borrowing at an attractive over 8% interest rate for the 91 day T. bills and between 10% and 15% for medium and long term bonds. This continues to crowd out the private sector and individual borrowers as the banks can still earn a decent return from the safe government securities.

Secondly, the high uncertainty/volatility of the EXR remains a constant threat to stable interest rates regime in the country. For instance, the CBK had to increase the T. Bill rates to over 11.45% in June 1999, peaking at 20.3% in January 2000 to stabilize the KES against the US$. They remained in the range of 10-15% for most of 2000, 2001 up to June 2002 when they dropped to about 8% and below. The cycle was repeated again in the period between August 2011 to August 2012, with the rates peaking at 20.56% in January 2012, when the KES entered into a free fall, loosing grounds of up to 26% (dropped from KES 85/US$ to KES 107/US$) against the US$ in the 2nd quarter of 2011/2012 financial year. This has been repeated again for most part of 2015 with the T. bill rates peaking at 22.5% in October 2015 to stabilize the KES after depreciating by 21% (KES 87/US$ to KES 106/US$) between October 2014 to September 2015.

Thirdly, the banking sector remains highly concentrated, with the 5 big banks controlling a sizeable share of the market. Kamau and Were (2013) finds that there still exists high inefficiencies in the banking sector, since their model tests reject the hypothesis that the high profits in the Kenyan banking sector are due to improved efficiency. As a policy recommendation, they argue that improved efficiency would be a key driver to increase competition in the industry, and thereby help reduce the ownership concentration in the sector. But of course, and as is expected, it's unlikely that the smaller banks will grow as fast to increase competitive pressure in the industry. Obviously, the "big boys" have no immediate and urgent incentive to improve efficiency as long as the potential for high and abnormal profits continue to exist. After all, they benefit most from the inefficiencies in the industry that support the continued concentration power.

2.3. Empirical Evidence

Mainly, available studies have focused on internal measures of bank performance as opposed to relating their profitability to stock returns. Samad and Hassan (1999) use ratio analysis to evaluate inter-temporal and interbank performance of Islamic banks in Malaysia. Grigorian and Manole (2002) and Kablan (2007) use the data envelopment analysis to assess the determinants of commercial bank performance in transition and measure the efficiency of banks in the West African Economic Monetary Union respectively.

De Young (1997) explores the challenges and misconceptions of measuring cost efficiency at financial institutions by demonstrating the pitfalls of accounting-based expense ratios while Afroze (2007) adduces empirical evidence on the correlation between IRS and deposit rates for commercial banks in Bangladesh. Kamau and Were (2013) use SCP analysis to assess the performance of the banking sector in Kenya. This study departs from the internal focus of bank performance to evaluate if the perceived superior

Table 1: Definition and description of the variables

Acronyms	Construction of variables	Data source
Market premium	Monthly % return $((V_t-V_{t-1})/V_{t-1}$ *100) of the weighted average market value of the NSE 20 share index month-end closing prices (proxy for market return [R_m]) minus ATB	KNBS/CBK
InCPI	Natural logarithm for monthly average consumer price index (measure of monthly inflation)	KNBS
InMS	Natural logarithm of the monthly average of broad money supply (M2[1])	CBK
InEXR	Natural logarithm of the average monthly exchange rate for the KES against the US$ (US dollar)	CBK
CS	Credit spread is the difference between commercial banks weighted average monthly lending rates and the monthly average of interbank (overnight) borrowing rates (proxy for long term and short term interest rates respectively)	CBK
ATB	Average monthly 91 day treasury bill rates (measure of risk free rate)	CBK

NB: KNBS: Kenya National Bureau of Statistics monthly economic indicators reports, CBK: Central Bank of Kenya. All data are available online from the two institutions websites, ATB: Average Treasury Bill, CS: Credit spreads, CPI: Consumer price index, KES: Kenya shilling

Table 2: Industry classification and description

Industry classification	Description	Number of listed firms*	Minimum**	Maximum***
A	Agriculture	6	6	8
B	Commercial and services	9	5	10
C	Banking	11	9	11
D	Insurance	6	2	6
E	Investment and services	5	2	5
F	Manufacturing and allied	10	7	8
G	Construction and allied	8	4	5
H	Energy and petroleum	5	3	5
I	Telecommunication and technology	1	1	2
J	Automobiles	3	3	5

*Number of firms listed as of December 2015, **Minimum number of firms in the portfolio during the period, ***Maximum number of firms in the portfolio during the period under consideration

performance (profitability) of commercial banks in Kenya is reflected on stock market. To assess this, we construct an industry portfolio for listed commercial banks in the NSE and compare its return with portfolio returns for other sectors of the economy.

From the foregoing therefore, if indeed the banking sector has exhibited superior performance above other sectors in the country, then we should expect the banks portfolio to outperform other portfolios based on investor rationality concept and wealth maximization goals. The efficient markets concept hypothesizes that security prices will adjust to reflect all historical information if in the weak form, all publicly available information if in the semi-strong form, and all private and professional analyzed information if in the strong form of efficiency (Brealey et al., 2011). If the NSE is at least in the semi-strong form of efficiency, these "abnormal profitability" sentiments in the Kenyan public domain ought to be reflected in the bank's stock returns.

3. DATA SOURCES AND DESCRIPTION OF VARIABLES

The study utilizes a time series data. Daily trading data has been obtained from the NSE for the period April 1996: December 2015. Further data has been obtained from the websites of the KNBS, the CBK and the 5 year NSE Handbooks from 1994: 2015. Specifically, the monthly value weighted NSE 20 share values (proxy for market return) and monthly CPI changes data are obtained from the monthly key economic indicator's reports and statistical abstracts from 1996 to December 2015, available on the KNBS website (www.knbs.or.ke/). Average monthly MS, the 91 day T. Bill rates, EXR, Interbank rates and weighted average commercial bank lending rates were downloaded from the CBK website (www.centralbank.go.ke/).

For the purpose of data analysis, the log values for the average monthly MS, average monthly EXR and average national monthly CPI are used. The CPI has 2009 as the base year. CS is computed as the difference between weighted average commercial bank lending rates and interbank rates while short term interest rates (proxy for risk free rate) is the average monthly 91 day T. bill rates. Accounting data, including pre-tax profits and number of issued shares for the each of the listed firms is obtained from the summary financial statements presented in the 5 year NSE Handbooks (1994:2015).

The variables used are defined and described in Table 1.

4. IDENTIFICATION STRATEGY

4.1. Industry/Sector Classification

All firms listed in the NSE are grouped into 10 industries/sectors. For ease of data analysis and presentation, the sectors have been defined and classified in Table 2.

4.2. Unit Root Test

In OLS regressions, non-stationary time series pose a risk of spurious results that could be misleading during interpretation. It is thus important to confirm first if the data series are stationary

1 MS2 includes M1, quasi money in banks and quasi money in non-bank financial institutions (NBFI's). M1 includes M0 (currency in circulation –cash in bank tills –commerative coins) + other deposits at CBK + demand deposits in banks.

or non-stationary, and if non-stationary to determine the order of integration. The presence of a unit root indicates that the data series is non-stationary. This study utilizes three common and widely used procedures to test for unit root namely the Augmented Dickey Fuller (ADF), Phillips-Perron (PP), and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) to test for unit roots in the time series.

Both the ADF and the PP-test the null hypothesis (H_0) that the data set being tested has a unit root. However, both procedures have again been criticized as having low power if the process is stationary but with a root close to the non-stationary boundary. KPSS-tests the alternative hypothesis to ADF and PP, that is, the data set is level stationary 1(0), around which the two earlier tests are criticized as being weak. KPSS-tests whether we have a deterministic trend versus a stochastic trend, and thus offers a robust check for stationary.

4.3. Study Methodology

4.3.1. Portfolio returns

Ratio analysis would have been a good approach to provide an insight into how the banking sector performance has fared compared to the other sectors of the economy. However, this approach is not feasible in this study given the difference in financial reporting requirements/regulations for the commercial banks, asset structure and composition of liabilities and nature of source of revenues. For instance, it would be practically misleading to compare asset based ratios for a commercial bank with those of a manufacturing enterprise given the differences in their asset structure. For a manufacturing entity, physical assets (machinery and equipment) constitute the largest investment in assets, while for commercial bank it would be loans advanced to customers and/or investments in technology to improve operational efficiency.

In this study, only a simple graphical analysis/presentation of the average before tax profits for each industry has been done to establish trends and demonstrate the perceived high profitability in the banking sector. This is because the reported high before tax profits has been the source of political and policy agitation to control interest rates in the banking industry.

In order to compare stock average returns, monthly portfolios are constructed for all listed firms in every sector/industry as grouped by the NSE assuming a buy and hold investment strategy. A simple value weighted average of the closing stock prices on the last trading day of each month is used to construct the portfolios. The closing price of the last day each stock was traded for every month is the opening price for the next period the stock is traded. For instance, if stock X is traded last on the 10th trading day of period t, and again on the 7th trading day of period t+1, then the closing price for period t is the stock price on the 10th trading day as well as opening price for period t+1 (7th trading day). Similarly, if the stock is not traded in period t+1, that stock is not included in that period's portfolio and the closing price on the 10th trading day at period t becomes the opening price on the first day the stock is traded in period t+2.

Portfolio excess returns are computed monthly for the entire period totaling 237 months. New listings in each sector are added to the portfolio based on the market price of their stocks at the end of the first trading month, with delisted or suspended firms being removed from the portfolio in the month of delisting. The monthly portfolio returns are computed as follows:

$$\frac{[(P_{XT}\times N_X)+(P_{Yt}\times N_Y)+(P_{Zt}\times N_Z)]-[(P_{Xt-1}\times N_X)+(P_{Yt-1}\times N_Y)+(P_{Zt-1}\times N_Z)]}{[(P_{Xt-1}\times N_X)+(P_{Yt-1}\times N_Y)+(P_{Zt-1}\times N_Z)]}\times 100$$

Where:

$P_{Xt}, P_{Yt}\ldots P_{Zt}$ = are closing prices of stocks X, Y and Z at period t.

$P_{Xt-1}, P_{Yt-1}\ldots P_{Zt-1}$ = are closing prices of stocks X, Y and Z at period t-1.

$N_X, N_Y\ldots N_Z$ = Number of listed shares for firms X, Y and Z.

Portfolio excess returns are then computed as follows:

$$R_{i,t}-R_{f,t}$$

Where: $R_{i,t}$ and $R_{f,t}$ are returns of portfolio i at period t and Rf_t the risk free rate (ATB) respectively.

A total of 10 portfolios are constructed for the following sectors: Agriculture, Commercial and Services, Banking, Insurance, investment and services, manufacturing and allied, construction and allied, energy and petroleum, telecommunication and technology and automobiles. Growth enterprise market is ignored in this study since it is fairly recent and lack long enough series to compare with other segments. The commercial banks portfolio excess return is then compared to the portfolio excess returns from other industries to determine if they outperform them on average over the period.

4.3.2. Regression models-CAPM

This study, being exploratory partly seeks to establish if the available data from the NSE can explain the perceived higher profitability of the banking sector in Kenya. Possible problems that might arise are the few number of listed firms and problems of illiquidity that characterize many emerging markets. While the NSE has a long history dating back to the mid 1940s, the market remains fairly small in the global stage, partly due to low growth of the Kenyan economy over the past 50 years of post-colonial error. However, despite its comparative small size, the market has evolved with the evolutions in stock markets around the world, has kept the pace of technological advancement, best business practice and norms, and today is ranked among the top 5 best stock markets in Africa. This implied efficiency offers the incentive to explore and test if the perceived superior performance of commercial banks has been priced in the market.

First, we test the CAPM alphas by regressing monthly portfolio excess returns based on the following time series:

$$R_{i,t}-R_{f,t}=\alpha_i+\beta_i(R_{m,t}-R_{f,t})+\varepsilon_{i,t}$$

Where $R_{i,t}-R_{f,t}$ is the return of portfolio i in excess of the risk-free interest rate (the 1 month Treasury bill rate) at time t; and $R_{m,t}-R_{f,t}$ is the value -weighted market return of the NSE 20 share index return (proxy for market return) minus the risk-free rate at time t.

However, the ability of CAPM to explain stock return variability has been brought into question based on empirical evidence from the most advanced markets like the USA over the recent past. While

CAPM has been found to hold with data from 1926 to 1968 (Black et al., 1972; Fama and MacBeth, 1973), it has been found not to hold with data from 1960s to 2000s (Reinganum, 1981; Lakonishok and Shapiro, 1986; Fama and French, 1993). If CAPM fails to hold in the most efficient markets, then it's only fair to first test if it will hold in the less efficient emerging markets like that of Kenya.

Borys (2007) using the FMB procedure tests if CAPM holds for the emerging markets of Visegrad countries (Hungary, Poland, Czech Republic and the Slovak Republic). She finds that they could not reject the classical CAPM in Hungary and Slovakia because the constant terms were not statistically significant from zero, even though the slope coefficients for the excess market returns were also not significant. This implied that the local markets alone could not explain the variation in stock returns. However, for Czech Republic and Poland they could reject CAPM since the terms were significantly different from zero, implying the presence of pricing errors in the model specification.

4.3.3. Multifactor model

Given the possible limitations of the classical CAPM in the foregoing literature, this paper will also use the multi factor model to test if an all bank stock portfolio outperforms other market segment portfolios of the NSE. In addition to the market premium, macroeconomic factors including CPI, broad MS, EXR, short term interest rates and CS are added into the regression equation.

From existing literature, macroeconomic factors including spreads between long and short term interest rates, expected and unexpected inflation, industrial productivity, credit risk spread between high and low grade bonds, term structure, country credit rating, market segmentation and momentum have been found to be priced in emerging markets (Chen et al., 1986; Erb et al., 1995;1996; Harvey, 1995; De Jong and De Roon, 2001; Borys, 2007; Ericsson and Karlsson, 2004).

The regression equation is as follows:

$$R_{i,t}-R_{f,t}=\alpha_i+\beta_m(R_{m,t}-R_{f,t})+\beta_1 DlnCPI_t+\beta_2 DlnMS_t+\beta_3 DlnEXR_t+\beta_4 CS_t+\beta_5 DATB_t+\varepsilon_{i,t}$$

Where:

$R_{i,t}-R_{f,t}$ = portfolio i excess return
α_i = constant
$\beta_m(R_{m,t}-R_{f,t})$ = market premium (market factor)
$\beta_1 DlnCPI_t$ = First difference of the natural log of CPI
$\beta_2 DlnMS_t$ = First difference of the natural log of broad MS (MS2)
$\beta_3 DlnEXR_t$ = First difference of the natural log of EXR
$\beta_4 CS_t$ = Credit spread (weighted commercial bank rates - interbank rates)
$\beta_5 DATB_t$ = Average 91 day ATB rates (short term interest rates)
$\varepsilon_{i,t}$ = error terms

5. MAIN RESULTS AND DISCUSSIONS

5.1. Descriptive Statistics

This study set out to examine if banking industry outperforms other sectors of the economy at the NSE market. The study utilizes time series data to regress the excess returns for 10 portfolios constructed for each sector. The descriptive statistics are presented in Table 3.

The mean for the market premium is −10.17% with a standard deviation of 9.36, a minimum of −34.86 and a maximum of 24.86. The average for inflation is 4.34%, a standard deviation of 0.45, a minimum of 3.57 and a maximum of 5.1%. MS has a mean of 13.3%, a standard deviation of 0.68, a minimum of 12.42 and a maximum of 14.62. The mean for EXR is 4.33% with a standard deviation of 0.14, a minimum of 3.98 and a maximum of 4.66%. The CS has a mean of 9.12%, a standard deviation of 4.16, a minimum of −10.39 and a maximum of 17.45. Short term interest rate has a mean of 10.49%, a standard deviation of 6.29, a minimum of 0.83 and a maximum of 27.15. Finally, the NSE 20 share index return has a mean of 0.31 with a standard deviation of 6.18, a minimum of −22.63 and a maximum of 32.52%.

From the summary of the industry portfolio weighted returns, telecommunications and technology sector (industry I) has the highest average return at 2.12% followed by the investment and services sector (industry E). The Banking sector (industry C) has a mean weighted return of 1.08 with the energy and petroleum sector (industry H) giving the lowest average return of −0.02%. On the return variability, investment and services has the largest standard deviation of 12.66% followed by Automobiles sector (industry J). The Banking sector has a standard deviation of 8.21 with commercial and services sector (industry B) showing the least variability in returns at 7.48%.

However, for comparative analysis of the various sectors, we shall drop the telecommunication and technology sector due to short data series and the fact that the industry largely constitutes of one listed firm, Safaricom Kenya Ltd., presumably the largest

Table 3: Descriptive statistics

Summary statistics				
Variable	**Mean±SD**	**Minimum**	**Maximum**	**Observe**
Market premium	−10.17±9.36	−34.86	24.86	237
InCPI	4.34±0.45	3.57	5.1	237
InMS	13.3±0.68	12.42	14.62	237
InEXR	4.33±0.14	3.98	4.66	237
CS	9.12±4.16	−10.39	17.45	237
ATB	10.49±6.29	0.83	27.15	237
NSE return	0.31±6.18	−22.63	32.52	237
Industry weighted returns				
Industry A	0.42±9.4	−41.16	62.04	237
Industry B	0.44±7.48	−25.82	31.33	237
Industry C	1.08±8.21	−24.98	37.39	237
Industry D	0.98±9.59	−25.28	52.53	237
Industry E	1.45±12.66	−43.01	76.98	237
Industry F	1.28±7.77	−23.48	56.77	237
Industry G	1±8.47	−21.37	33.88	237
Industry H	−0.02±9.49	−35.45	45.03	237
Industry I	2.12±9.64	−30.65	28.85	103
Industry J	0.39±10.08	−32.89	47.4	237

ATB: Average Treasury Bill, CS: Credit spreads, CPI: Consumer price index, SD: Standard deviation

and most profitable company in the Eastern and Central African region. This may preclude a fair comparison of the performance of the various sectors in the Kenyan stock market.

5.2. Unit Root Test Results

Regression with non stationary time series data can result into spurious results. To check if the time series is stationary, three approaches including the ADF, PP, and KPSS procedures are conducted to test for unit roots in the data. ADF and PP-test the null (H_0) that the series in non stationary while the KPSS-test the null (H_0) that the series is stationary. If the estimated t-statistics (absolute values) are larger than the asymptotic critical values at the 1%, 5% or 10% confidence levels, then we reject the null, and accept the alternative hypothesis. The unit root tests are presented in Table 4.

From these tests, inflation, MS, EXR and short term interest rates are assumed to have trends while market premium, CS and excess returns are random walks with no trends. The ADF test fails to reject the null for MS, EXR and short term interest rates but rejects the null for market premium, inflation and CS. It rejects the null at the first difference for MS, EXR and short term interest rates and inflation. This implies market premium and CS are stationary at level 1(0) while MS, EXR and short term interest rates have unit roots and are integrated at order 1(1). Inflation has mixed results.

The PP-test is theoretically a robust test of unit roots to ADF. The test confirms the ADF results except for inflation that it now finds non stationary at level but integrated of order 1(1). All the other variables are consistent with the ADF tests under the PP-test. Finally, the KPSS-test that the data set is level stationary 1(0), around which the two earlier tests are criticized as being weak. Thus, it tests whether we have a deterministic trend versus a stochastic trend, and thus offers a robust check for stationary. The KPSS-tests are consistent for all the variables except that it contradicts ADF and PP for market premium and CS by rejecting the null at 1% and 10% confidence levels respectively. This could be explained by the fact that KPSS assumes trend stationary by default while we assumed them as non-trending.

To solve the unit root problem in the non-stationary data series, the first difference is used for these variables in the regression equations.

5.3. Industry Profitability Analysis

Due to the difference in the asset structure and regulation requirements for the banking and other financial sectors, no attempt has been done to conduct ratio analysis which could have been a good indicator of the performance of the banking sector vis a vis other sectors of the economy. However, we compute the average before tax profits for each of the sectors for the period 1994:2014 from the published financial statements of the listed firms to ascertain the perceived above normal profits for the banking industry. Industry I (Telecommunication and Technology) is dropped from this analysis as it constitutes only one company (Safaricom Kenya Ltd). In addition, the industry has a fairly short data series with the only 2 firms in it (Access Kenya and Safaricom Kenya Ltd.) first listing in June 2007 and June 2008 respectively, and Access Kenya delisting in May 2013. The results are presented in Figure 2.

From the trends evident on the graph, the banking industry (C) is dominant in terms of reported before tax profits for virtually the entire 21 year period. The gap with other industries particularly widens from 2007, increasing at an increasing rate to peak at an average of KES 10 billion (US$ 0.1 billion) in 2014, while all the other sectors remained stagnant or declined at below an average of KES 4 billion (US$ 0.04 billion). This clearly confirms the perceived above normal profitability of the banking industry in Kenya in comparison to other sectors of the economy.

5.4. CAPM Regression Results

With recent evidence on the failure of CAPM with data from the mid 1960's for advanced markets, this paper first tests if it holds for the emerging market of Kenya. Technically, for CAPM to be said to hold, the constant from the regression equations should

Table 4: Unit root test results

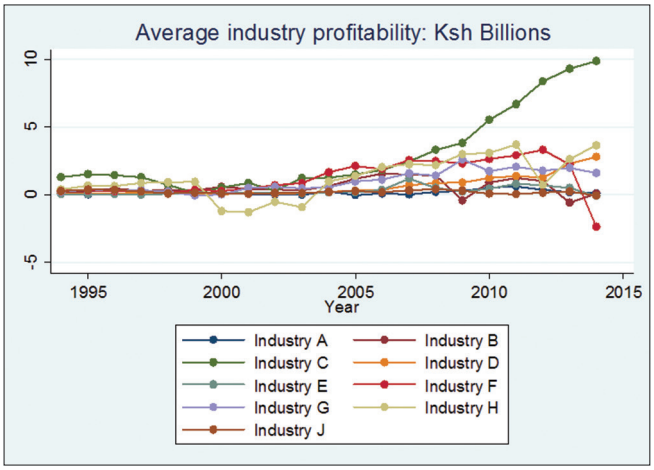
Variable	Unit root test for stationary			
	ADF-test	PP-test	KPSS-test	Order of integration
	H_0: Variable is non stationary	H_0: Variable is non stationary	H_0: Variable is stationary	
Market premium	−8.128***	−8.245***	1.9***	1 (0)
InCPI	−3.451**	−2.801	2.33***	
ΔInCPI	−4.946***	−9.448***	0.0544	1 (1)
InMS	−2.657	−1.251	5.63***	
ΔInMS	−3.29*	−17.277***	0.137	1 (1)
InEXR	−2.14	−2.028	1.88***	
ΔInEXR	−4.851***	−11.842***	0.0893	1 (1)
CS	−4.021***	−5.114***	0.121*	1 (0)
ATB	−1.853	−2.511	3.47***	
ΔATB	−5.001***	−11.28***	0.0305	1 (1)
Asymptotic critical values				
1%	−3.999	−3.995	0.216	
5%	−3.433	−3.432	0.146	
10%	−3.133	−3.132	0.119	

*** implies significant at 1% level, ** implies significant at 5% level, * implies significant at 10% level. Δ represents first difference, ATB: Average Treasury Bill, CS: Credit spreads, CPI: Consumer price index, ADF: Augmented Dickey Fuller, PP: Phillips-Perron, KPSS: Kwiatkowski-Phillips-Schmidt-Shin

not be significant from zero. If significant, it implies other factors other than the market premium might explain the variability in stock returns. The CAPM regression results are presented in Table 5.

The results for each of the 10 portfolios indicate the market premium β are all significant at the 1% degree confidence level. The Banking industry has the highest β at 1.03 followed by telecommunications and technology industry with 1.018. Third is the investment and services sector at 1.007, followed by Insurance and energy and petroleum industries at 0.996. commercial and services and automobiles industries take the sixth and seventh position with 0.904 and 0.898 respectively. The others are construction and allied 0.858, manufacturing and allied 0.849 with agriculture having the least β at 0.823. The constant terms are insignificant for seven of the 10 portfolios with agriculture, banking and telecommunication and technology indicating significance at the 5% confidence levels. Theoretically, these results imply CAPM could explain stock return variability for most of the sectors of the Kenyan economy. Implicitly therefore, we cannot reject the validity of CAPM for the emerging market of Kenya.

Figure 2: Industry profitability analysis



5.5. Multifactor Model Results

While we may fail to entirely reject the validity of CAPM in the Kenyan case, the significant constant terms for 3 of the 10 portfolios points to the possibility of other variables that could explain stock return variability. Due to limitation of data that could allow us to perform the Fama and French 3 factor model, we extent the regression model to factor in 5 macro variables (inflation, MS, EXR, CS and short term interest rate) in addition to the market factor. These results are presented in Table 6.

The market factor βs from the multifactor model results indicate a marginal decline for all the portfolios and remain significant at the 1% degree confidence level. Again, the Banking sector β remains the highest at 1.023 but now followed by Insurance industry at 1.007 as opposed to telecommunication and technology in the CAPM results. Agriculture retains the lowest β at 0.816. Not surprisingly, the macroeconomic variables are largely statistically insignificant across most of the portfolios.

Table 5: CAPM regression outputs

CAPM regression results										
Industry	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
Market	0.823***	0.904***	1.030***	0.996***	1.007***	0.849***	0.858***	0.996***	1.018***	0.898***
premium (β)	(13.55)	(21.69)	(26.85)	(17.43)	(12.9)	(18.34)	(15.99)	(19.37)	(10.08)	(14.46)
Constant	−1.687**	−0.843	1.08**	0.636	1.212	−0.559	−0.752	−0.374	2.30**	−0.96
R^2	0.4387	0.6669	0.7541	0.5638	0.4147	0.5888	0.5212	0.6148	0.5013	0.471
Adjusted R^2	0.4363	0.6654	0.7531	0.5619	0.4122	0.587	0.5192	0.6132	0.4964	0.4687

*** means significant at 1% confidence level, ** means significant at 5% confidence level, CAPM: Capital asset pricing model

Table 6: Multifactor model outputs

Multifactor model regression results										
Industry	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
Market	0.816***	0.907***	1.023***	1.007***	0.965***	0.852***	0.831***	0.986***	0.985***	0.870***
premium (β)	(12.93)	(21.16)	(25.56)	(16.88)	(12.02)	(17.91)	(15.26)	(18.44)	(8.22)	(13.83)
InCPI	27.776	−0.875	−17.312	−12.427	2.137	−30.44	54.951	0.01	154.415	167.53***
	(0.51)	(−0.84)	(−0.50)	(−0.24)	(0.03)	(−0.75)	(1.18)	(0.00)	(1.61)	(3.10)
InMS2	53.699	−58.08**	−4.323	−38.152	93.198*	−48.113	9.28	48.256	118.945**	64.755
	(1.25)	(−1.99)	(−0.16)	(−0.94)	(1.71)	(−1.49)	(0.25)	(1.33)	(2.20)	(1.51)
InExrate	7.25	−23.954	0.621	−2.971	26.081	3.182	47.259**	−7.388	−71.663**	−23.11
	(0.29)	(−1.40)	(0.04)	(−0.12)	(0.81)	(0.17)	(2.17)	(−0.35)	(−2.48)	(−0.92)
ATB	0.501	−0.361	−0.079	−0.151	−0.403	−0.706**	−0.424	0.388	0.213	0.355
	(1.22)	(−1.29)	(0.30)	(−0.39)	(−0.77)	(−2.28)	(−1.20)	(1.11)	(0.50)	(0.87)
CS	−0.015	0.07	0.081	−0.075	0.258	0.022	0.156	0.022	−0.038	0.056
	(−0.10)	(0.68)	(0.85)	(−0.53)	(1.35)	(0.19)	(1.21)	(0.17)	(−0.19)	(0.38)
R^2	0.4445	0.6761	0.7530	0.5628	0.4334	0.6014	0.5395	0.6171	0.5684	0.501
Adjusted R^2	0.430	0.6676	0.7465	0.5513	0.4185	0.591	0.5275	0.6071	0.5414	0.488

***means significant at 1% confidence level, ** means significant at 5% confidence level, * means significant at 10% confidence level, ATB: Avarage Treasury Bill, CS: Credit spreads, CPI: Consumer price index

However, inflation has a positive and statistically significant effect for Automobile industry and MS indicates a negative effect for commercial and services industry and a positive effect for both investment and services and telecommunication and technology industries. These effects are statistically significant at the 5% confidence level. EXR indicates a positive and statistically significant effect for the construction and allied industry and a negative and statistically significant effect for the telecommunication and technology industry. Short term interest rates only indicate a negative and statistically significant effect for the manufacturing and allied industry.

While statistical significance is not necessarily an indicator of economic significance and neither is statistical insignificance an indicator of the absence of economic effects from the various macro variables, it would appear the macro variables indicate mixed effects for the various industries.

Since the focus of this study is to establish if there is empirical evidence that the banking sector outperforms other sectors in the Kenya economy, we predict and graph the excess returns from the multifactor model regression results. For purpose of clarity, we plot the predicted values of the banking sector against predicted values of 2 other industries at a time. The results are presented in Figure 3.

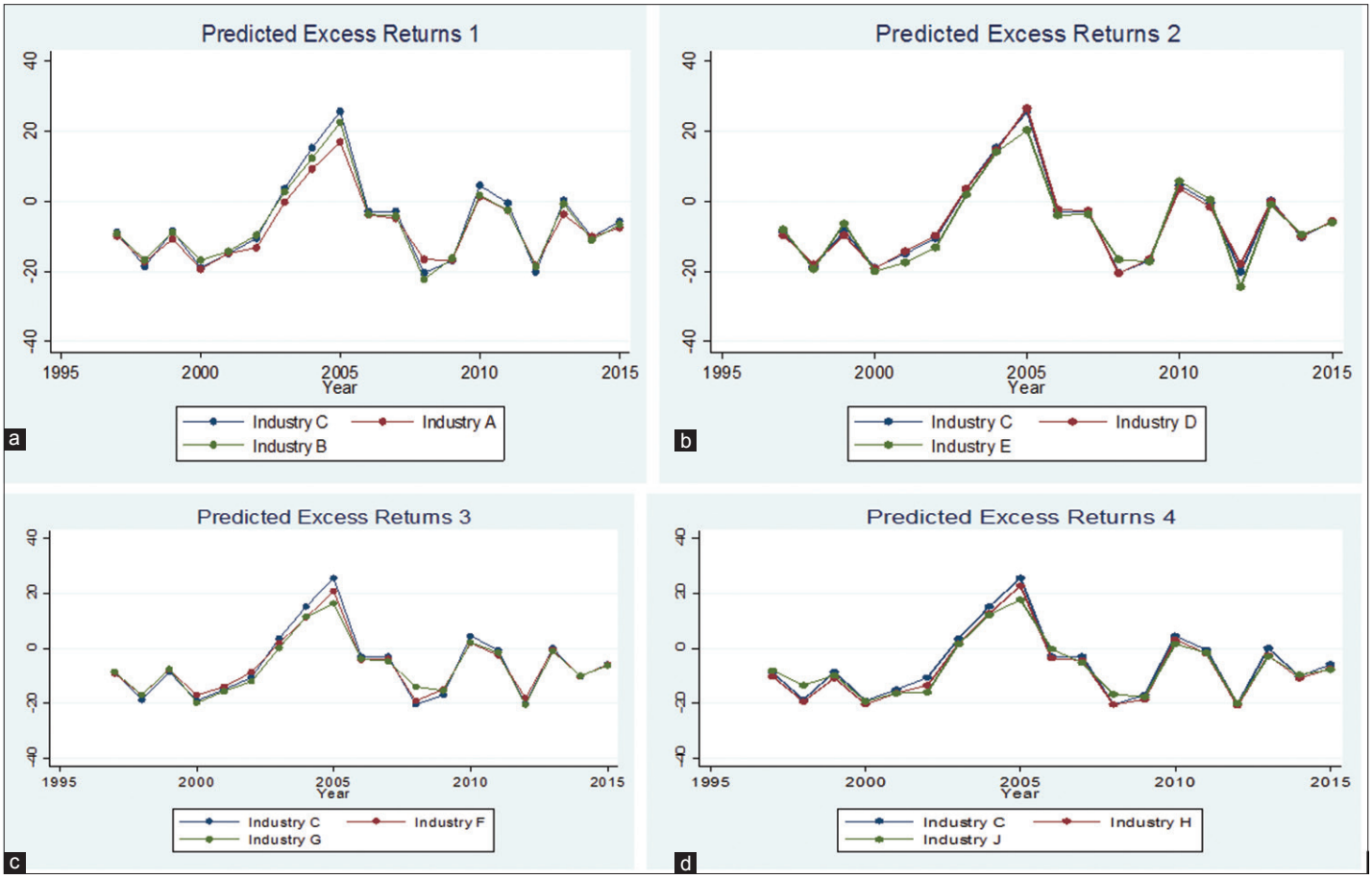
The graphs clearly indicate that the banking portfolio predicted excess returns outperform all other sectors of the economy except for the insurance industry which seems to move together. This close movements with the insurance sector wouldn't be surprising given both industries belong to the wider financial sector, and often both industries offer complementary products. For instance, from the early 2000s, the banking sector in Kenya opened credit to salaried employees under unsecured loan facilities payable through a check-off system deductible to the employee by the employer. This credit facility has an insurance component that extends income benefits to the insurance industry. Not surprisingly also, most banks in Kenya have opened an insurance agency product under the brand name of "Bancassurance."

These results suggest that the above normal profits (evidenced by the high average pre-tax profits) enjoyed by the banking sector in Kenya eventually get priced in the stock market. This could also perhaps imply that the NSE is at least in the semi - strong form of market efficiency since the publicly available sentiments of high profitability of the banking sector seems to be reflected in the stock prices, assuming investor rationality and objectivity to make optimal decisions.

6. CONCLUSION

These study set out to establish if an all banking sector investment portfolio outperforms other sector investment portfolios at the NSE market. The empirical evidence adduced in this study suggests that on average, the banking sector portfolio outperforms other

Figure 3: (a-d) Visual comparative of portfolio predicted excess return



sectors from the predicted excess returns. The pre-tax profitability analysis supports the perceived "above normal profits" for the banking sector within the Kenyan economy.

The predicted excess returns suggests this high profitability sentiments for the banking sector have indeed been priced in the stock market, and could imply that the NSE market has characteristics of at least the semi-strong form of efficiency. Portfolio regression results from CAPM seem to suggest that we cannot reject its validity in the emerging market of Kenya. However, the data limitation of this study cannot be overlooked that could have allowed us to apply more recent empirical approaches like the now widely popular Fama and French 3 factor model.

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