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Impact of stock exchange market on the Kenyan economy: A case study of the Nairobi stock exchange

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The study was carried out to assess the major roles played by the stock exchange as well as its impact on the Kenyan economy. The study has focused on of sample of 20 companies listed in the NSE which includes five from the four market segments. The agricultural sector was represented by for Sasini Tea and Rea vipingo plantations. The commercial and allied sector was represented by Kenya Airways and Nation Media group. Industrial and allied sector was represented by British American Tobacco and East African Breweries. Finance and investments sector was represented by Barclays Bank and NIC Bank. Alternative investment Market Segment (AIMS) was represented by Wilson Tea while the entire market was represented by NSE 20 Index.

An interview guide was used as an instrument to collect primary data on the performance of the companies and as well as their NSE 20 share index.

The data collected was been analyzed using content analysis, linear and non linear regression model. R software was used to show the linear and non linear regression analyses. There was a steady increase in NSE 20 index from 2002 – 2006 followed by drop to 2009.

Key words: Stock Exchange, Nairobi stock market, NSE 20 share index, content analysis, linear and non linear regression model.

Introduction

According to the NSE website the Nairobi Stock Exchange was established by the British in the 1920s with no formal trading facilities. Formally, the Nairobi Stock Exchange was opened in 1954 as a stockbrokers' voluntary association. Up until 1963 share trading was restricted among the British residents of Kenya. After Kenya's independence in 1963, share trading in Nairobi was made open to all.

Considering the proposal, which was given by the then finance minister of Kenya Sir Ernest Vasey and Francis Drummond, the London Stock Exchange officials approved the creation of the Nairobi Stock Exchange as an overseas stock exchange in July, 1953.

In 1954, the Nairobi Stock Exchange was comprised as a voluntary organization of stockbrokers enrolled under the Societies Act. The business of trading in shares was restricted only to the European settler community. Africans and Asians were not permitted to deal in securities. In 1963, Kenya became independent and Africans and Asians were permitted to deal in securities. In the first three years of independence, the economic development was stable, market confidence was regenerated and the exchange operated several highly oversubscribed public issues.

In 1972, the development was discontinued and share prices were depressed, when the oil crisis brought in inflationary pressures in the economy.

In 1984, A Central Bank of Kenya study, "Development of Money and Capital Markets in Kenya" was known as a blueprint for structural reforms in the financial markets which helped the creation of a regulatory body, 'The Capital Markets Authority' (CMA) in 1989. Kenya Airways became the largest share issue in the history of NSE after its Privatization in 1996. The Kenya Airways Privatization team was awarded the World Bank Award for Excellence for 1996.

Between 1998 and 2000 the government continued to encourage the growth of its capital markets by the creation of the Central Depository System. It also espoused the International Accounting Standards (IAS) as the local Accounting Standards and passing of two critical acts namely the Central Depository System (CDS) Act in 2000 and the Capital Markets Act.

In February 2001, basic reformation of the capital market of Kenya took place and divided the market into four independent market segments: the Main Investments Market Segment (MIMS), the Alternative Investments Market Segment (AIMS), the Fixed Income Securities Market Segment (FISMS) and later Futures and Options Market Segment (FOMS).

In the 2001/2002 budget, the Government offered the extra incentives to capital markets investments. On17th April 2002, the CMA declared the sanction of the new NSE trading and settlement rules with amendments. On 26th July 2002, with the introducing of a New Foreign Investor Regulations, there are three categories of investor on the capital markets; local, East African and foreign.

On 5th August 2002, the Nairobi Stock Exchange, the Capital Markets Authority of Kenya, the Association of Kenya Stockbrokers, the CMA Investor Compensation Fund, and 9 institutional investors through the Capital Markets Challenge Fund signed a Shareholder Agreement for establishment of the Central Depository and Settlement Corporation (CDSC).

The current expansion is fairly broad-based and is built on a stable macro-environment fostered by government, and the resilience, resourcefulness, and improved confidence of the private sector.

Nairobi continues to be the primary communication and financial hub of East Africa. Due to the enormous economic reforms, private companies have continued to prosper and have even taken an option of floating their shares on the Nairobi Stock Exchange (NSE) .Liberalization of capital markets has also encouraged foreign investors to invest.

As of now the Stock Exchange in Nairobi has emerged among the top four stock exchanges in sub-Sahara Africa. The total turnover of this stock exchange in 1996 achieved through trading of 114 million shares was US $ 75 million. During the same period, i.e. from 1963 to 1996 the number of stock brokers has increased from 6 to 20 and trade commission on stocks has come down from 2.5% to between 1% and 2%. The commission on fixed deposits has come down to 0.05%.

According to the NSE website, the Nairobi Stock Exchange was incorporated under the Companies Act of Kenya in 1991 as a company limited by guarantee and without a share capital. Prior to 1991, it was registered as a voluntary association of stockbrokers under the Societies Act in 1954.

Currently, fourteen stockbrokers and three investment banks form the membership of the NSE. The current number of listed companies is forty six.

The issue of stock market has been a major issue of concern for people who want to buy or sell shares and the questions lies which company to invest in. The overall solution lies with the leading stock exchange which will give one the right information on the companies listed with them. Various studies have been done on the issues of the stock exchange like the growth of the NSE capital market and capital markets in emerging economies but none of the studies has touched on the impact of the impact of the stock exchange market to the Kenyan economy , hence the need for this study to bridge the Knowledge gap.

The study was undertaken to evaluate the impacts of the stock exchange in the Kenyan economy and to survey the market performance for various companies listed with the Nairobi Stock Exchange.

Materials and Method

The research methodology included the research design, the population of interest, sample size, data collection instruments and the data analysis technique.

Research Design

The study was carried out through a survey method.

Target Population

The targeted population was the companies listed with the Nairobi stock exchange. In total they were Forty six (46) in number, comprising 4 companies in the agricultural sector, 18 companies in the industrial and allied sectors, 13 companies in the finance and investment sector, and 11 companies in the services sector.

Sample size

The sample size comprised of twenty two companies trading in the Nairobi stock exchange

Data collection instruments

An interview guide was issued to the managers and shareholders of the companies listed with the NSE were used to collect primary data. Secondary data was from previous published literature and information from the relevant websites.

Data Analysis

The secondary data collected was analyzed using regression analysis with the help of R-software. A simple linear and non-linear was used in the analysis of the data. The information was interpreted with the use tables and graphs.

Simple linear regression model was used **to** analyze share prices and the share index over the years and was done as follows:

$P_t = \alpha + \beta Y_t + \varepsilon_{t\ i=1,2}$

ε_t is $N(0_{,\sigma}{}^2)$ with $cov(t_t,t_{t'})=0$ where $t=t'$

P_t is the share price, while Y_t is the year.

Varibles α and β were estimated using ordinary Least Square Method so that,

$S = \sum (P_t - \alpha - \beta Y_t)^2$ is minimum

The conditions being:-

$\delta s / \delta\alpha = o \quad , \delta s/\delta\beta = 0$

$\delta s/\delta\alpha = \delta s/\delta\beta \boldsymbol{\Sigma}(P_t - \alpha - \beta Y_t)^2$

$= \ -2\sum (P_t - \alpha - \beta Y_t) = 0$

$= \Sigma (P_t - \alpha - \beta Y_t) = 0$……………1

$\delta s/\delta\beta = 0 \ => \delta/\delta\beta \sum (Pt - \alpha\beta Y_t)2$

$=2\sum(P_t - \alpha\beta Y_t)\ (-Y_t) = 0$

$=\sum (P_t - \alpha - \beta Y_t)\ (Y_t) = 0$

$=\sum (P_t/Y_t - \alpha Y_t \beta Y_t^2)$……………2

From 1 we have

$\sum P_t - \sum\alpha - \sum\beta Y_t = 0$

$\sum P_t = \sum\alpha + \sum\beta Y_t$

$\sum\alpha + \sum\beta Y_t = \sum P_t$

$\alpha\sum 1 + \beta\sum Y_t = \sum P_t$ where summation was for the last six years

$6\alpha + \beta 6\bar{Y} = 6]$………………..3

From 2 above we have
$\sum P_t Y_t - \alpha\sum Y_t - \beta\sum Y_t^2 = 0$

$\alpha\sum Y_t+\beta\sum Y_t^2=\sum P_t$

$\alpha 6Y\sum+\beta\sum Y_t^2=\sum P_tY_t$…………..4

Equations 3 and 4 above are simultaneous equations, from which α and β were solved. Making α the subject from 3, leads to:-

$6\alpha=6\bar{P}-\beta 6\bar{Y}$

$\alpha=\bar{P}-\beta\bar{Y}$…………………5

Substituting for α from 5 into 4 , yields,

$6\bar{Y}\ (\bar{P}-\beta\bar{Y})+\beta\Sigma Y_t^2=\Sigma P_tY_t$

$6\bar{Y}\bar{P}-6\beta Y^2+\beta\Sigma Y_t^2=\Sigma P_tY_t$

$\beta\ [\Sigma Y_t-6\bar{Y}^2]=\Sigma P_tY_t-6\bar{Y}\bar{P}$

Therefore $\hat{\beta}=(\Sigma P_tY_t-6\bar{Y}\bar{P})/(\Sigma Y_t-6\bar{Y}^2)$

Hence $\hat{\alpha}=\bar{P}-\hat{\beta}\bar{Y}$

The fitted model is $P_t=\hat{\alpha}+\hat{\beta}Y_t$ for the linear model and for the non linear model which is also the binomial model. It follows,

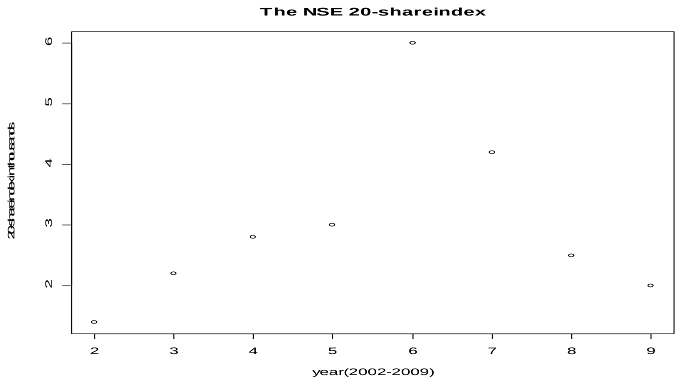
$Pt=\alpha+\beta 1Yt+\beta 2Yt^2$ with $\varepsilon\sim N(0, \delta^2)$ which is calculated using R-cran software. The Y-intercept can be found which is given by the values of $\hat{\alpha}$. x value are given by the $\hat{\beta}$. The linear equation is used determine the best fitted line.

Illustration using R-software

```
> year<-c(01,02,03,04,05,06,07,08,09)
> Share index<-c (1.4, 2.2, 2.8, 3, 6, 4.2, 2.5, 2)
> Plot (year, shareindex, xlab="year (2002-2009)",ylab="20-shareindex
in thousands”, main="The NSE 20-shareindex")
> Plot (year,shareindex,xlab="year(2002-2009)",ylab="20-shareindex
in thousands”, main="The NSE 20-shareindex")
```

The result is a scatter plot (Fig. 4.1)

Figure 4. 1: NSE 20 Index scatter plot




```
> Lm (shareindex~year+year^2)

Call:
Lm (formula = share index ~ year + year^2)

Coefficients:
(Intercept)        year
2.1679       0.1536

> z=year^2
> nse<-lm(shareindex~year+z)
> Summary (nse)

Call:
lm (formula = shareindex ~ year + z)

Residuals:
1       2       3       4       5       6       7       8
 0.4875 -0.2054 -0.6518 -1.0518  1.7946  0.2875 -0.6732  0.0125

Coefficients:
      Estimate Std. Error t value Pr(>|t|)
(Intercept) -3.41250    2.25473  -1.513   0.1906
year             2.60893    0.91023   2.866   0.0351 *
z               -0.22321    0.08141  -2.742   0.0407 *
---
Signif. codes:  0 `***' 0.001 `**' 0.01 `*' 0.05 `.' 0.1 ` ' 1

Residual standard error: 1.055 on 5 degrees of freedom
Multiple R-Squared: 0.627,      Adjusted R-squared: 0.4779
F-statistic: 4.203 on 2 and 5 DF,  p-value: 0.08494

> fittednse<--3.4125+2.60893*year+z*-0.22321
> fittednse
```

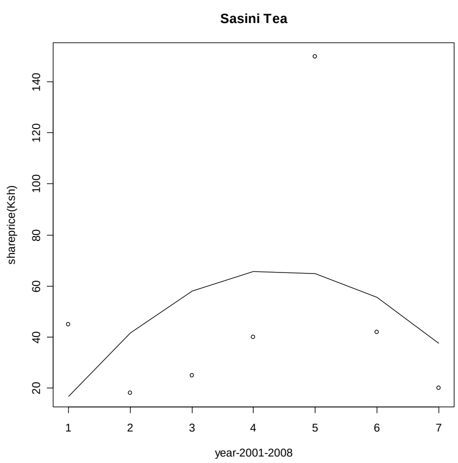
[1] 0.91252 2.40540 3.45186 4.05190 4.20552 3.91272 3.17350 1.98786
> lines(year,fittednse)

Results and discussion

Non linear regression analysis for the agricultural sector was conducted for Sasini Tea (Fig. 4.2), Rea vipingo plantations (4.3). The commercial and allied sector was represented by Kenya Airways (Fig. 4.4) and Nation Media group (Fig. 4.5). Industrial and allied sector was represented by British American Tobacco (Fig. 4.6) and East African Breweries (Fig. 4.7). Finance and investments were represented by Barclays Bank (Fig. 4.8) and NIC Bank (Fig. 4.9). Linear regression analysis was done for Wilson Tea (Fig. 4.10) which represented Alternative investment Market Segment (AIMS) while the entire market was represented by NSE 20 Index (Fig. 4.11).

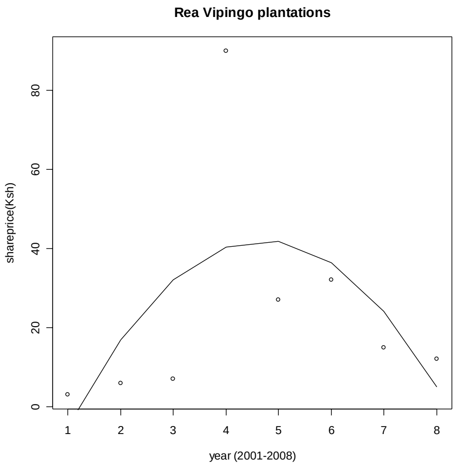
There was a gradual increase in share prices over time (Fig. 4.2) with a remarkable rise in 2005 followed by a sharp drop in the subsequent years.

Figure 4. 2: Non linear regression analysis for Sasini Tea



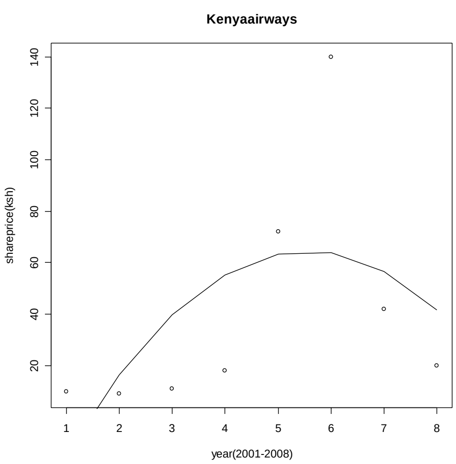
There was slow increase in prices from 2001-2003 (Rea Vipingo, Fig. 4.3) followed by a drastic increase in in 2004. These drastic increases in price were attributed to reforms in the company like change of management policies or peak seasons experienced by the market. And the drastic drop of prices of these agricultural products were due to environmental factors like long spells of drought and high inflation rates which were experienced is seen from the year 2006-2008.

Figure 4. 3: Non linear regression analysis for Rea Vipingo



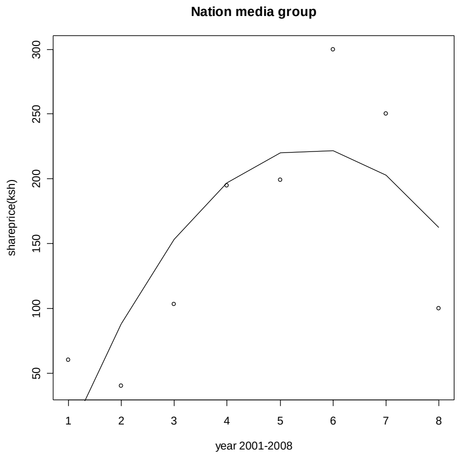
There was a slow change in the share prices from 2001-2004 (Kenya Airways, Fig. 4.4) which can be described as zero gradient. After the full privatization of the company in 2005, a positive relationship between time and the share price was seen. The prices went up until 2007. This was attributed to the political instability after the general elections. The company was also boosted by the tourism sector and hence after the violence experienced in 2007 and early 2008, there low tourist influx.

Fig. 4.4. Non linear regression analysis for Kenya Airways



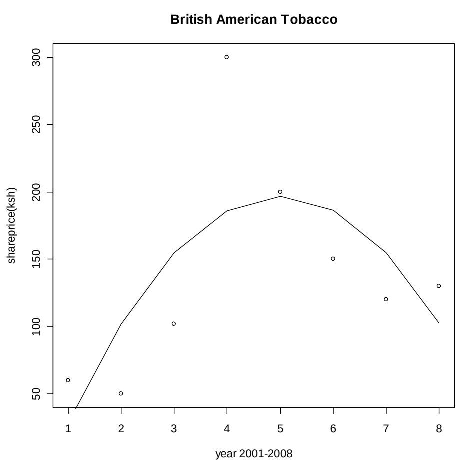
The company's share prices increased positively from 2002-2006 (Nation Media Group, Fig. 4.5), recording up to a price of Kshs 300, which was on the higher side and hence a positive return to shareholders. There was a drastic drop in share price in 2007 and the 2008. The best fitted line showed a downward trend.

Figure 4. 4: Non linear regression analysis for Nation Media Group



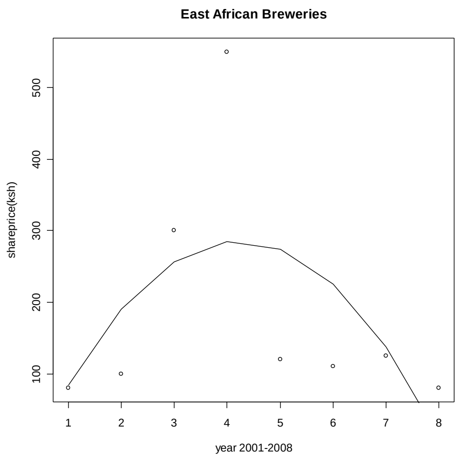
There was a positive relationship between the share price and the years from 2002-2004 (British American Tobacco, Fig. 4.6). The company has had a high profit for it to have positive returns in the share prices over time. A drop in the share price is seen from 2005 to 2008 which gives a negative relationship between the share prices over time.

Fig. 4.6. Non linear regression analysis for British American Tobacco



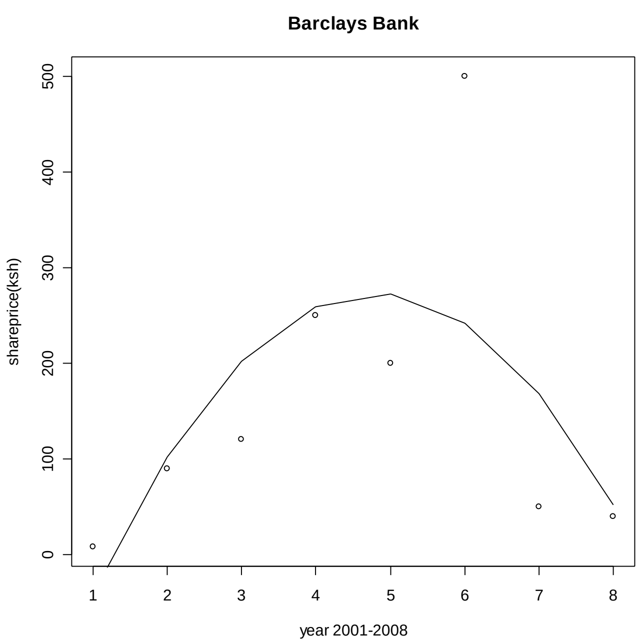
The East African breweries had a positive relationship between share price and the and time. (East African Breweries, Fig. 4.7). Years (2001-2004) recorded highest price of Kshs 550. There was a drastic drop in share prices from 2005 up to 2007.

Figure 4. 5: Non linear regression analysis East African Breweries Limited



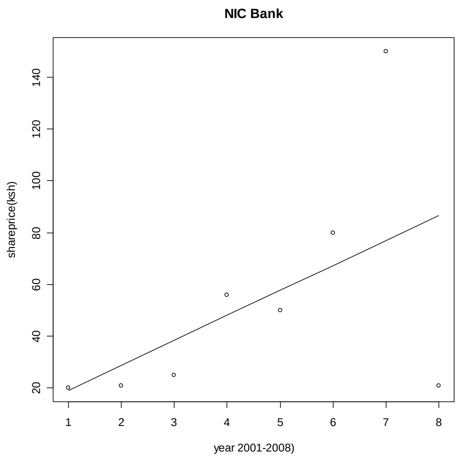
There was a positive relationship between the share prices over the years from 2001-2004 (Barclays Bank, Fig. 4.8). The prices later dropped to Kshs 180 from Kshs 250 and in 2006 the prices shot up to over Kshs 400. This was a positive return to shareholders in the company. A drastic drop of share prices to less than Kshs 100 was experienced in 2007 and 2008.

Figure 4. 6: Non linear regression analysis Barclays Bank



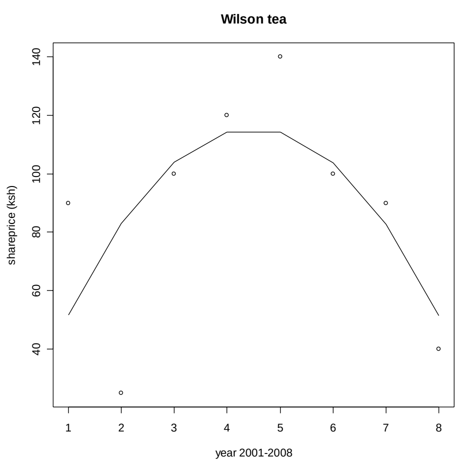
There was a steady rise in prices over time in from 2001-2003 and later to 2004 (NIC Bank, Fig. 4.9), which is a positive relationship between the share prices over time. The share price continued to rise up to 2007 and later the price fell drastically in 2008. A linear model has been illustrated since there has been a steady increase in share price over time. The fitted line can be extended to forecast the values of the consequent years.

Figure 4. 7: Linear regression analysis **for** NIC BANK



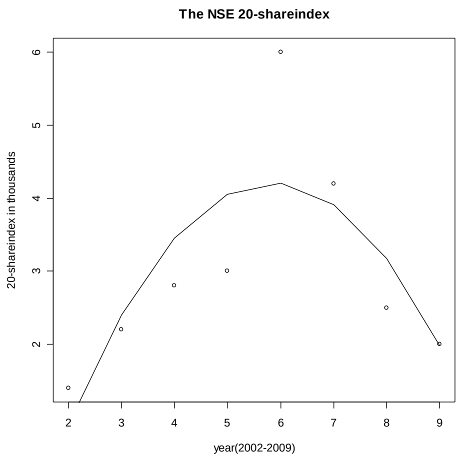
The company recorded a positive relationship between share prices and time from 2001-2005 (Wilson Tea, Fig. 4.10). From 2006 the share prices dropped up to 2008 leading to a negative slope and showing a downward trend in the company's shares.

Figure 4. 8: Non linear regression analysis for Wilson Tea



There had been a steady rise of the share index as from 2002 to 2006 (NSE 20 Share Index, Fig. 4.11). This was attributed to investor confidence in the stock exchange due to change in the government. The NSE started to experience a downward trend from the 2007 due to the anxiety associated with year general election at the end of that year.

Figure 4. 9: NSE 20 Share Index



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