

# Covid-19 and its Effect on the Performance of Nairobi Securities Exchange in Kenya

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**Abstract:** This paper is organized in such a way that, a brief overview of different economic crises that have affected the world are presented. The objective of this paper is to find out the effect of the announcement of the first case of Covid-19 in Kenya on the performance of Nairobi securities exchange. The design of this paper is descriptive based. The Nairobi Securities Exchange (NSE) share index data was obtained 72 days before and 72 days after the announcement of the first case of Covid-19 in Kenya. The mean indices were computed and tested for statistical significance. The independent variable is the announcement of Covid-19 case in Kenya while the Nairobi Securities Exchange indices before and after the announcement of Covid-19 in Kenya are the dependent variables. The results were tested at 0.05 level of significance.

**Keywords:** Nairobi Securities Exchange Index, Covid-19 and NSE-Nairobi Securities Exchange

## 1.1 Introduction

Economic crisis is a situation in which the economy of a country experiences a sudden downturn brought by unforeseen circumstances. It is characterized by unemployment, low prices, low levels of trade and investment (Sanusi, 2017). According to Abubakar (2014) historical evidence shows that the economic crisis in the world economy is not a new issue but an event that recurs after a long period of time. In 1930 the world experienced the Great Depression that started in the United States after a major fall in stock prices. During this time the world gross domestic product (GDP) fell by an estimated 15 percent while international trade fell by more than 50 percent. Personal income, tax revenue, profits and prices dropped. Unemployment in the United States rose to 23 percent and in most African countries rose as high as 33 percent (Abubakar, 2014).

The financial crisis of 2007-2008, well known as the global financial crisis, was a severe world economic crisis. According to Tobat and Akbar (2016) the crisis was the worst of its kind since the Great Depression of 1930. The effect of the global financial crisis was similar to that of great depression of 1930. Currently (2020) the world is yet experiencing another crisis after the outbreak of a new virus (COVID-19) which was declared a global pandemic by the world health organization (WHO) on 11<sup>th</sup> March 2020. The outbreak began in China in November 2019 and by 12<sup>th</sup> June 2020 more than 7.6 million people globally had been confirmed to have contracted the virus, out of whom 3.8 million had recovered, and more than 423,901 had died (WHO, 2020). In Africa by 12<sup>th</sup> June 2020 all African countries had reported 209,380 COVID-19 cases with 5,689 deaths from the virus (Africa CDC, 2020). According to United Nations Department of Social and Economic Affairs (UN-DESA) Global economic growth is expected to decline by 1%. According to a report by World Bank the economic growth in sub-Saharan Africa will decline from 2.4 percent in 2019 to between -2.1 percent and -5.1 percent in 2020, depending on the success of measures taken to mitigate the pandemic's effects. In Kenya the first case of Covid-19 was reported on 13<sup>th</sup> March 2020 and as of 12<sup>th</sup> June there were more than 3,200 confirmed cases with 92 deaths (MoH-Kenya, 2020).

## 1.2 Statement of the Problem

It is evident that global economic crises caused by different factors ranging from financial to pandemic is not new; but events that recur after a long period of time. The key question being addressed in this paper, is to what extent did the announcement of the first case of Covid-19 influence the stock market in Kenya? Investors are curious to know the extent to which tense business environment caused by pandemics influence their stock investment performance. Therefore, it is pertinent that investors in the Kenyan equity market know the impact of the announcement of Covid-19 case in Kenya on their investment performance.

## 1.3 Research Objective

The study sought to find out the effect of the announcement of the first case of Covid-19 in Kenya on the performance of Nairobi securities exchange in Kenya.

## 1.4 Research Hypothesis

**H<sub>0</sub>:** There is no significant effect of the announcement of the first case of Covid-19 in Kenya on the performance of Nairobi securities exchange in Kenya.

**H<sub>a</sub>:** There is a significant effect of the announcement of the first case of Covid-19 in Kenya on the performance of Nairobi securities exchange in Kenya.

## 2.1 Literature Review

This part covers the theories that lays the foundation for this study. The theories discussed are the efficient market hypothesis and modern portfolio theory.

### 2.1.1 Efficient Market Hypothesis

The theory of Efficient Market Hypothesis (EMH), was postulated by Markowitz in the year 1952 and later named by Fama in the year 1970. The theory assumes that financial markets incorporate all public information and asserts that share prices reflect all relevant information. Correct information is important in forming expectations and allowing investors to correctly process all available information, and where the discount rate is consistent with a normatively acceptable preference specification (Fama, 1970). The EMH's concept of informational efficiency has a Zen-like, counter-intuitive flavor to it. The more efficient the market, the more random the sequence of price changes generated by such a market, and the most efficient market of all is one in which price changes are completely random and unpredictable.

### 2.1.2 Modern Portfolio Theory

The theory of modern portfolio by Markowitz (1952) explains how investors select a portfolio with the highest possible return given a certain level of risk. There exists a positive correlation between expected return and risk of a financial asset. This implies that if an investor takes high risk, he/she is compensated for with a higher return (Markowitz, 1952).

## 3.1 Research Methodology

The section presents the research methodology that covered the study.

### 3.2 Research Design

This study adopted an exploratory non-experimental research design. This design is conducted in areas where few studies have been conducted and the focus is on gaining insights and familiarity (Creswell & Creswell, 2017). Using the design, the study helped gain insights and familiarity about the effect of the announcement of the first case of Covid-19 in Kenya on performance of Nairobi securities exchange in Kenya by comparing performance of Nairobi securities exchange before and after the outbreak of the Corona Virus in Kenya (Covid-19).

### 3.3 Data Type and Source

The study employed quantitative secondary data. In order to achieve the objective of this study, the researcher used data derived from Nairobi securities exchange (20) index. Nairobi Securities Exchange indices were obtained 72 days before the 13<sup>th</sup> March 2020 when the first case of Covid-19 was reported in Kenya and 72 days after the first case of Covid-19 was reported.

### 3.4 Data Collection Instrument

This refers to the instruments that the researcher used in collecting the data. In this case the instrument that was used is the data collection worksheet.

### 3.5 Testing Validity and Reliability of the Instrument

Cooper and Schindler (2006) classified three methods of testing reliability and Validity of data collected using any type of instrument. These are objectivity, reliability and validity tests. The objectivity test is concerned with the relationships that exist between on the result and the criteria used in the study.

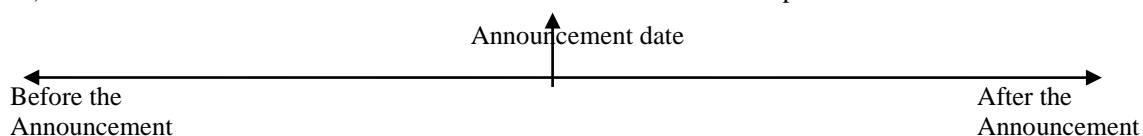
Acceptable and reliable test most provide 90% of the same or similar results, even when the instrument was used by a different scholar, at a different time and environment (Sounders, 2008). The instrument that was used in this research has already been used by many scholars in different environment for example Abubakar (2014), Obere (2009) and Anthony (2006) and the outcome of the research proved the validity and the reliability of the instrument in an objective manner.

Again, the reliability of the instrument depends on the consistency obtained in the results. The three cases cited also proved the reliability of the instrument at various points and time in the research environment. Similarly, the objectivity of the instrument is to prove the correctness of the result beyond any reasonable doubt which Saunders (2009) emphasizes in his research book. Therefore, this research is not exceptional since the bases of the data that was used is secondary in nature and the instrument is recognized as one of the most suitable for collecting the data, thus, the instrument is said to be valid, reliable and acceptable.

### 3.6 Empirical Model

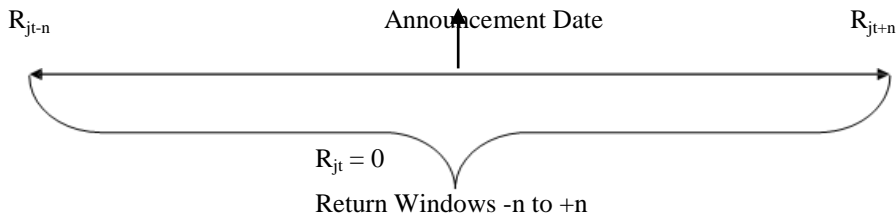
The empirical model was based on Event study. Event study is best suited for small samples and is used to examine the market reaction in relation to return based on specific information related to the stock. The information can be acquisition of ownership announcement, acquisition of new technology, merger policy, stock split, major financial scandal within the firm and outside the firm, change in government policy toward the operation of the firm and natural disaster among others factors. The model considered the following five steps in operation:

- a) Identification of the event to be studied and the date the event was pronounced.



**Figure 3.1: Announcement date**

- b) Collection of the return date around the announcement date. This step includes the period of calculation of the return, which can be daily, weekly, monthly, quarterly, semiannually, or annually if no event occurred, which will interfere with the existing event, and how long should the period be calculated? Before and after the announcement, identification of exact return window date i.e. period that the event started. This information is depicted in figure 3.2



**Figure 3.2: Return window**

Where;

- $R_{jt}$  is return for firm  $j$  at time  $t$ .
- $-n$  is period before announcement.
- $+n$  is period after announcement.

- c) Calculation of excess return.

$$ER_{jt} = R_{jt} - \text{Beta}_j R_{mt} \dots \dots \dots 3.1$$

Where;

- $ER_{jt}$  is excess return for firm  $j$  at time  $t$ .
- $R_{jt}$  is return on firm  $j$  at time  $t$ .
- $R_{mt}$  is market return at time  $t$ .

- d) Calculate the average and the standard error of the entire excess return.

- e) Determine whether the excess return around the announcement date is different from zero or not.

**3.7 Data Analysis Procedure**

The study considered the announcement of the first case of Covid-19 in Kenya as an event which occurred at a particular point in time. An event study can be outlined to include: defining event of interest, determining event window i.e. period over which Nairobi Securities Exchange indices were examined for comparative purpose and event horizon. While the procedure includes selecting the frequency of the sample, determining the method of measurement of average and cumulative returns and method of testing the hypothesis (Ngugi, 2005; Mack & Inlay, 1997; Green, 2005 cited in Obere, 2009 & in Abubakar *et al*, 2014). This study was a modification of an ordinary event study because the analysis never captured normal and abnormal returns, instead it only captured the means and variance of change in order to compare the before and after results.

**3.7.1 Event Window**

Event period covered one day that is the day when the first case of Covid-19 was reported in Kenya. The day was 13<sup>th</sup> March 2020.

**3.7.2 Event Horizon**

Event horizon is the period before an event and an equal period after the same event in which the event is expected to have a major impact. There are no strict theoretical rules for choice except that the pre-event and post-event periods should not coincide. The study considered 72 days before and after the event. This horizon was large enough to provide numbers for means and variance analysis for measurement of returns, but not too large to cause event overlap.

**3.7.3 Sign Test**

Sign test was used to test the existence of the two hypothetical statements already established as null and alternative, which state that the announcement of Covid-19 in Kenya has or does not have an effect on performance of Nairobi securities exchange. The test is presented statistically as:

$$H_0: R_{11} = R_{12} \dots \dots \dots 3.2$$

Where;

- $R_{11}$  is return for period before announcement of Covid-19 in Kenya.
- $R_{12}$  is return for period after announcement of Covid-19 in Kenya.

**3.8.5 Data Analysis and Interpretation**

This research adopted two procedures in analyzing the data. The first part was to modernize the event study model to comparative event study model, so that the application of two sample t test of means and variance, using descriptive statistics could be

attainable. The second part was the required aggregation of the returns as applicable to sign test for hypothesis testing on supportive as well as independent using 95% level of significance to determine the acceptability of any result above 0.05% and rejection of any result below 0.05% as statistically presented below:

$$H_o: \delta_{11}^1 = \delta_{12}^2 \dots\dots\dots 3.3$$

$$H_{a1}: \delta_{11}^1 > \delta_{12}^2 \dots\dots\dots 3.4$$

$$H_{a2}: \delta_{11}^1 < \delta_{12}^2 \dots\dots\dots 3.5$$

Where;

$\delta_{11}^1$  is variance before the announcement of Covid-19 in Kenya.

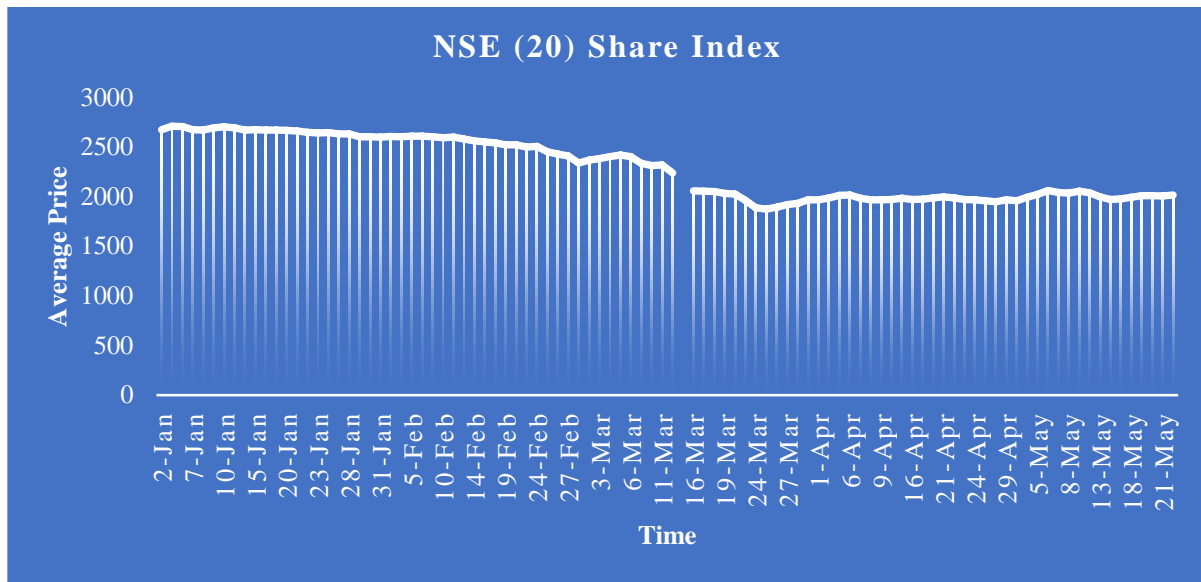
$\delta_{12}^2$  is variance after the announcement of Covid-19 in Kenya.

**3.9 Presentation of the Findings**

Presentation of the results was done through tables, graphs and statistical representation of the estimated models.

**4.1 Results and Findings**

The objective of the study sought to establish the effect of Covid-19 announcement in Kenya on performance of Nairobi securities exchange. Nairobi Securities Exchange indices for 72 days before 13<sup>th</sup> March 2020 when the first case of Covid-19 was reported in Kenya and 72 days after the first case of Covid-19 was reported are presented in figure 4.1.



**Figure 4.1: Nairobi Securities Exchange indices for 72 days before and after the Announcement of Covid-19 in Kenya**  
 Source (Author, 2020)

Results in figure 4.1 show that generally there was a greater decline in trading at Nairobi securities exchange after the announcement of the first case of Covid-19 in Kenya. This implies that the announcement of the first case of Covid-19 in Kenya had an effect on the performance of Nairobi securities exchange.

**4.1.1 Paired Sample Statistics**

There was generally high difference between the mean of Nairobi securities exchange indices before and after the announcement of the first case of Covid-19 in Kenya as shown in table 4.1.

**Table 4.1: Paired Sample Statistics**

	N	Mean	Std. Deviation	Std. Error Mean
NSE (20) Index Before Covid-19	50.000	2556.420	126.116	17.835
NSE (20) Index After Covid-19	47.000	1986.980	43.560	6.354

**Source (Author, 2020)**

The results in table 4.1 confirm that the announcement of the first case of Covid-19 in Kenya had an effect on the performance of Nairobi securities exchange.

**4.1.2 Paired Samples Test**

To determine whether the difference in the mean was just by chance or it could be statistically explained, the paired t- test was computed to establish the level of significance. For this study the effect was considered significant if the p – value was less than 0.05. The results are presented in Table 4.2.

**Table 4.2: Paired Samples Test**

	Mean Difference	Std. Error Difference	t	df	Sig. (2- tailed)
Equal variances assumed	569.440	19.405	29.345	95.000	.000
Equal variances not assumed	569.440	18.933	30.076	61.177	.000

Hartley test for equal variance: F = 8.382, Sig. = 0.0000

**Source (Author, 2020)**

The results in table 4.2 indicate that there was a statistically significant difference in the mean of Nairobi securities exchange indices before and after the announcement of the first case of Covid-19 in Kenya ( $t = 29.345$ ;  $p - \text{value} = 0.000$ ), this implied that the change in Nairobi securities exchange indices was not by chance but it was as a result of the announcement of the first case of Covid-19 in Kenya. In this case the null hypothesis was rejected.

**5.1 Conclusions**

The study concludes that the announcement of the first case of Covid-19 in Kenya had a significant effect on the NSE indices. Indeed, the mean difference of 569.440 was attributed to the Announcement of the first case of Covid-19 in Kenya. The study also concludes that a sound health environment creates confidence in business environment which improves investor confidence, thus increasing their investments.

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**Appendix I: NSE (20) Share Index Before the Announcement of the First Case of Covid-19 in Kenya**

<b>Time</b>	<b>Average Price</b>
2-Jan	2674
3-Jan	2708
6-Jan	2706
7-Jan	2672
8-Jan	2670
9-Jan	2692
10-Jan	2701
13-Jan	2692
14-Jan	2669
15-Jan	2672
16-Jan	2670
17-Jan	2669
20-Jan	2667
21-Jan	2659
22-Jan	2648
23-Jan	2642
24-Jan	2643
27-Jan	2632
28-Jan	2630
29-Jan	2603
30-Jan	2602
31-Jan	2600
3-Feb	2605
4-Feb	2602
5-Feb	2609
6-Feb	2608
7-Feb	2602
10-Feb	2594
12-Feb	2599
13-Feb	2580
14-Feb	2559
17-Feb	2551
18-Feb	2540
19-Feb	2523
20-Feb	2522
21-Feb	2499
24-Feb	2504
25-Feb	2452

26-Feb	2429
27-Feb	2410
28-Feb	2337
2-Mar	2368
3-Mar	2383
4-Mar	2403
5-Mar	2419
6-Mar	2401
9-Mar	2336
10-Mar	2311
11-Mar	2317
12-Mar	2237

**Appendix II: NSE (20) Share Index After the Announcement of the First Case of Covid-19 in Kenya**

<b>Time</b>	<b>Average Price</b>
16-Mar	2058
17-Mar	2053
18-Mar	2049
19-Mar	2032
20-Mar	2025
23-Mar	1959
24-Mar	1887
25-Mar	1873
26-Mar	1891
27-Mar	1918
30-Mar	1931
31-Mar	1966
1-Apr	1968
2-Apr	1985
3-Apr	2013
6-Apr	2016
7-Apr	1983
8-Apr	1968
9-Apr	1967
14-Apr	1970
15-Apr	1984
16-Apr	1969
17-Apr	1974
20-Apr	1986
21-Apr	1995

22-Apr	1986
23-Apr	1971
24-Apr	1968
27-Apr	1958
28-Apr	1948
29-Apr	1967
30-Apr	1958
4-May	1991
5-May	2022
6-May	2060
7-May	2041
8-May	2035
11-May	2054
12-May	2039
13-May	1996
14-May	1970
15-May	1975
18-May	1994
19-May	2007
20-May	2009
21-May	2004
22-May	2015