Original Research Article

COVID-19 PANDEMIC AND THE PERFORMANCE OF LISTED SECURITIES: EVIDENCE FROMTHE NAIROBI SECURITIES EXCHANGE IN KENYA

Abstract

The Novel Coronavirus pandemic led to panic that resulted to volatility of stock prices across the securities exchange in the world. This saw foreign investors liquidating their positions for fear of a market crash in Nairobi Securities exchange (NSE). The specific objective of the study was to determine the effect of Covid-19 pandemic on the performance of listed securities at the NSE in Kenya. Daily data for 5 months, 154 days since the period 13th March 2020 to 14 August 2020 was utilized.The study applied linear regression analysis model to find out the effect of Covid-19 daily cases on the performance of listed securities at the NSEin Kenya. The study findings revealed that Covid-19 daily cases and weather changes had a negative and statistically significant effect on the performance of listed securities at the NSE. The results inferred that Covid-19 daily cases affected the performance of listed stocks at the NSE since the announcement of the first Coronavirus cases in Kenya. The findings from this study are useful for policy implications as it provides guidance to policy makers to institute applicable policy reactions in line with the course of current coronavirus pandemic or during future pandemics of similar nature.

Keywords: COVID-19, coronavirus, pandemic, performance, stocks, Nairobi securities exchange, daily data, Kenya

JEL Classifications:G12, I15

Contribution/Originality: This study is one of very few studies that have investigated on the novel effect of COVID-19 pandemic on the securities market performance in Kenya**.**

1. INTRODUCTION

The announcement of Coronavirus Pandemic (COVID-19)caught the world's attention in January 2020. The increasing numbers of confirmed cases and the very rapid spread of the virus triggered swift reactions from the Chinese government. The lockdown of the entire city of Wuhan that was effected on 23rdJanuary2020 surprised the entire world but later proved to be an effective policy intervention by the People's Republic of China. On 30thJanuary2020, the World Health Organization declared the Corona virus outbreak in China to be a public health emergency of international concern. During that period, the cumulative numbers of confirmed cases were approximately 7,800, while 18 countries outside the People's Republic of China had confirmed 83 cases. South Korea became the second country to experience a major outbreak of COVID-19, the third country following was Iran. South Korea's cases spiked from 31 cases to over 1,000 cases within a week while within a period of 12 days, Iran cases moved from zero to over 1000 cases. China and South Korea were majorly under control in March when the epicentre of the pandemic moved to Europe and USA; Italy leading with the highest fatality rate, USA has been leading with reported total cases. The reported cases globally as at 16thAugust 2020 indicated that COVID-19 had killed at least 761,779 people and infected at least 21.29million since the outbreak emerged in China last year in December 2019 (WHO,2020). The Coronavirus pandemic had affected all securities markets globally especially the trend of security prices had fallen drastically and endlessly. The Dow Jones and S&P had witnessed a drop of approximately 20% of their share prices

Comment [R1]: too many words repeated

causing a fall out that weakens the financial markets. On the same note, the impact of COVID-19 on the financial markets was experienced by Nikkei which trades with Tokyo securities exchange. Nikkei experienced share price volatility and a falling trend over time ever since the outbreak of the COVID-19. The pandemic made financial markets to opt out of varied trading guidelines, which ultimately influenced the global economy (Nuhu 2020).

As by August 2020, the Coronavirus pandemic had spread in all African countries and it escalated and worsened intensively. The interference of the global economy via implementation of social and travel restrains, the sudden fall in fiscal revenues and prices of commodities and distractions of international value chains in the African Continent were among the core reasons for the negative growth. International trade in the African Continent was anticipated to decrease by approximately 35% from previous level that was recorded in 2019. Therefore, the value was predicted to plummet to an approximate value exceeding 270billion US dollars. The fight against the spread of the virus and medical treatment was projected to escalate public financial spending in Africa to an expected value of at least 130 billion (Deloitte,2020).

During the WHO's certified declaration of COVID-19 as a global pandemic, financial markets all over the world had started to fall. A good instance is the S & P 500 that recorded its highest point of 3386.15 on 19thFebruary 2020, then again dropped to 2237.40 on 23rdMarch2020, which amounted to 30 percent shrinkage within a period of one month. The financial markets in Africa have been drastically affected by COVID-19. The Johannesburg securities exchange top 40 index in South Africa slumped by 3.7% on the 24th of February 2020 following the announcement of coronavirus cases. Investors in Africa considered short-selling options following a decline of Top 40 index share prices. All shares index nose-dived in Morocco in reaction to the announcement of confirmed coronavirus cases, leading to loss of value in equity investments in the stock exchange. In Kenya, security prices continued to dive after the first case of coronavirus pandemic had been announced forcing the Nairobi Securities Exchange to adjourn trading for the NSE 20 index on 13th March 2020 in line with its equity trading rules that necessitated trading deferment if there is a drop of more than 5% (Ozili, 2020).

Kenya has continued to experience enormous damage to the economy in terms of loss of employment and deterioration of GDP. The occurrence of COVID-19 has heightened the challenges facing the Kenyan economy that had been experienced before the virus. The disruptive effects of COVID-19 affected the performance of financial markets, caused depreciation of the Kenyan shilling, reversal of fiscal and monetary policies, decreased remittances to diaspora and interference of global supply chains. Many foreign investors with massive investments in Nairobi securities exchange liquidated their positions in March 2020 when the first cases of COVID-19 were reported in Kenya. The fear by foreign investors of a collapse in the market led to an enormous decline in the securities prices that were traded at the Nairobi securities exchange. The NSE-all share index gradually diminished in value by approximately 300 basis points from Mid-March 2020 to end of May 2020; a trend that was reflected in the Kenyan economy performance (Odhiambo, Weke, &Ngare, 2020).

1.2 Statement of the problem

The performance of securities market is relevant in enhancing the economic growth of numerous countries. An announcement of any event tends to carry good or bad news which spills over to the securities market. The emergence of COVID-19 has overwhelmed the entire world causing panic in the securities market exchanges worldwide.The coronavirus pandemic

has caused severe global market challenges hence increasing security market risk. The pandemic continued to accelerate external shocks in the securities market thatwrecked the desired economic trend leading to unexpected shifts to market sentiments, (Gormsen&Koijen, 2020)

The Kenya's securities market was hit by COVID -19 when the first case was reported in the country on 13th March 2020. The announcement of the first COVID- 19 case in the country halted trading at the Nairobi Securities Exchange (NSE) after the NSE 20 share index plummeted at an average of more than 5% with Safaricom and KCB securities dropping by 5.4% and 7.0% respectively. The performance of the bourse had dropped sharplywith the NSE 20 share index having fallen by 26.05% on a year to date basis forcing foreign investors to liquidate their positions in reaction to the evolving pandemic. Ever since the onset of the pandemic, a majority of investors have opted for a net selling position with a motive of investing in fixed income securities because of market uncertainties (Odhiambo *et al*, 2020).

Despite the fact that the Coronavirus pandemic is still unfolding and mutating with intermittent effects on securities markets, it is appropriate to utilise the available confirmed medical cases and security market data to make recommendations that inform policy in relation to the reaction of the Nairobi Securities Exchange to COVID-19 pandemic

2. LITERATURE REVIEW

2.1 Theoretical review

The Black Swan theory

The theory was pioneered by Nassim Talib in 2007, Talib applied the origination of the novel black swan to demonstrate impulsive unforeseen events that influence the securities market and business activities positively or negatively. The theory is made in reference to events that are extremely erratic of which the associated effects on the securities market, money markets and entire economy are very severe. Black swan theory is relevant to the current study given that the origin of COVID-19 in China shocked the whole World particularly its exceptional nature, which has resulted into high mortality rate and health challenges as well as global security market crisis. Given the extraordinary level of randomness of Black Swan events, financialspecialists recommended diversification of investments to cushion against the severe effects of Black Swan events. This is why the diversification of investment portfolios haveproliferated in the past years since the occurrence of numerous unpredicted events, which comprised inter alia, the subprime crises of 2007, the world financial crisis of 2008 to 2009, the internet bubble burst, the European public debt crises. The past pandemics such as Severe Acute Respiratory Syndrome (SARS), the 2009 swine flu disease and the 2014 Ebola disease are also examples of black swan events. The sudden emergence of COVID-19 without prior warning from the medical experts baffled and astounded the global health experts to the point that no vaccine has been discovered even after eight months of its development with snowballing rate of infection and deaths that has caused the World Health Organisation (WHO) to declare it a world pandemic. The simultaneous effect of COVID-19 has soared into diverse strikes in the global securities and money markets triggering doubt among investors. The closure of nation-wide boundaries and limitations in movement has affected international supply chains, which has also triggered the stock markets into impulsive precariousness (Ngwakwe, 2020).

2.2 Empirical review

COVID-19 and the performance of Nairobi Securities Exchange

Nuhu (2020) investigated the impact of the COVID - 19 on thefinancial markets from the period dated 1st March 2020 to 25th March 2020 in China and USA by applying a simple regression model.Time series data from China COVID - 19 Statistics Reports andTrading Economics for China and USAwere employed by the study. The study used the Shanghai Stock Exchange as asample for China and the New York Dow Jones as a sample for the USA. The COVID-19 confirmed cases were the independentvariable while Shanghai Stock Exchange and New York Dow Jones weredependent variables of the study in China and USA respectively. The study findings revealed that there is a positivesignificant relationship between the COVID - 19 confirmed cases and all thefinancial markets (Shanghai stock exchange and New York Dow Jones) from 1stMarch 2020 to 25th March 2020 in China and USA implying that COVID-19impacted the financial markets from 1st March 2020 to 25thMarch 2020 in China and USA.

Ngwakwe (2020) using differential analysis examined the effect of COVID-19 Pandemic on the selected stock indexes specifically the Shanghai Composite Stock Index (for China); the Euronext 100 (for EU); the Dow Jones Industrial Average and S&P 500 (for the United States). Stock market index data on these four stock indexes were collected for fifty days before and within COVID-19 pandemic. Applying the t-test of difference in mean stock values, the findings from the analysis indicated a significant effect of COVID-19 pandemic on two stock indexes – the Shanghai Composite Index and the Dow Jones Industrial Average. The Shanghai Composite Index showed resilience to COVID-19 pandemic with a significant gain in stock values during the first fifty days into the pandemic. On the contrary, the Dow Jones Industrial Average experience adverse impact from the COVID-19 pandemic with a significant loss of stock market value on its index during the first fifty days into the COVID-19 pandemic. Even though the difference in stock values during the COVID-19 pandemic for Euronext 100 and the S&P 500 were not statistically significant, their mean stock index values exhibited a decline in value during the sample period of the first fifty days within COVID-19 pandemic. Additionally, Ngwakwe findings also showed that all the four stock market indexes experienced a higher degree of stock value volatility during the first fifty days within the COVID-19 pandemic.

Dayong, Min &Qiang (2020) studied financial markets under the global pandemic of COVID-19 by providing a simple yet innovative statistical analysis of the impact of the COVID-19 pandemic on stock market risk. The virus had affected many thousands of lives and led to a lot of challenges to countries from all over the globe. The financial markets have seen dramatic movement on an unprecedented scale. Dayong*et al* (2020) findings indicated that the world securities markets risks have heightened considerably in reaction to the pandemic. Distinctive securities market responses were evidently related to the severity of the outburst in each country. The great uncertainty of the pandemic and its associated economic losses has caused markets to become highly volatile and unpredictable. They emphasized on policy reactions to contain the virus and level the stock markets, however, they noted that non-conventional policy interventions, such as the US' unlimited QE, might create further uncertainty and could cause long-term problems. Their results further indicated that countries were not working together to cope with the challenges, as markets in the country group that were studied were responding differently to national-level policies and the general development of the pandemic. Eventually, the tendency toward disintegration in the global community is more of a threat than the virus.

Najaf, Zeeshan, Farrukh, Xin, Umer&Ma (2020) documented on the relationship between weather, COVID-19 outbreak in Wuhan and the Chinese economy using daily average temperature (hourly data), daily new confirmed cases of COVID-19 in Wuhan, and RMB (Chinese currency) exchange rate to represent the weather, COVID-19 outbreak and the Chinese economy, respectively. The methodology of Wavelet Transform Coherence (WTC), Partial Wavelet Coherence (PWC) and Multiple Wavelet Coherence (MWC) was employed to analyse the daily data collected from 21st January 2020 to 31st March 2020. The results revealed a significant coherence between the series at different time-frequency combinations. The overall results suggested the insignificance of an increase in temperature to contain or slow down the new COVID-19 infections. The RMB exchange rate and the COVID-19 showed an out phase coherence at specific time-frequency spots suggesting a negative but limited impact of the COVID-19 outbreak in Wuhan on the Chinese export economy. Najaf *et al* (2020) results were contrary to many earlier studies that suggested a significant role of temperature in slowing down the COVID-19 spread. Their results have important policy implications for the containment of COVID-19 spread and macro-economic management with respect to changes in the weather.

Indrajit, Atul &Rupam (2020) investigated the effect of novel coronavirus 2019 and its resulting disease, the COVID-19, on the foreign exchange rates and stock market performances of India using secondary data over a period of 48 days. The study explored whether the causal relationships and directions among the growth rate of confirmed cases, exchange rate and SENSEX value were the same across different pre and post-lockdown phases by attempting to capture any possible variations over time using Vector Auto Regressive (VAR) models. A positive correlation was found between the growth rate of confirmed cases and the growth rate of exchange rate, and a negative correlation between the growth rate of confirmed cases and the growth rate of SENSEX value. The findings discovered on applying a VAR model indicated that an increase in the confirmed COVID-19 cases had no significant change in the values of the exchange rate and SENSEX index. The result varied when analysis was split across different time periods i.e. before lockdown, first phase of lockdown and extension of lockdown. Comprehensive and practical explanations of the numeric results indicated significant changes across time in terms of the relation between the variables of interest. The detailed knowledge about the varying patterns of dependence could potentially help the policy makers and investors of India to develop their policies to cope up the situation.

3. METHODOLOGY

Time series secondary data for the reported number of infected cases for COVID-19, weather changes and stock index was collected from our World in Data, CBK weekly statistical bulletin and AccuWeather Inc. respectively. Daily data for 5 months;154 days since the period 13thMarch 2020 to 14 August 2020 was utilized.Weather changes in Kenya as measured by average temperatures in degrees centigrade are taken as control variable influencing both the dependent and independent variable. A linear regression analysis estimation model was employed to analyse data. The following econometric model was employed:

$$\boldsymbol{SI_t} = ß_0 + ß_1\boldsymbol{COV_t} + ß_2\boldsymbol{WTC_t} + Ɛ_t$$

Where:
SI_t = NASI/ Nairobi all share index

$ß_o$ = Intercept
COV_t = COVID-19 daily new cases
WTC_t = Weather changes as measured by Temperature in degrees Centigrades
$Ɛ_t$ = Error term
$ß_1, ß_2$ = Beta coefficients

4. RESULTS

4.1 Descriptive Statistics

The descriptive statistics in Table 1 revealed that the average for NASI,Covid-19 daily cases and weather changes were 135.778, 186.71 and 19.66 respectively. The variations from the mean are also moderate as illustrated by the standard deviation of 4.86, 234.38 and 1.5975 for NASI, Covid-19 daily cases and weather changesrespectively.

Table 1: Descriptive statistics

	Mean	Std. Deviation	N
NASI	135.7776	4.86783	154
Covid-19 daily cases	186.714	234.3795	154
Weatherchanges	19.662	1.5975	154

4.2 Correlations

The correlation results presented in table 2 indicated that Covid-19 daily cases and weather changes had a statistically significant relationship with Nairobi All Share Index (NASI) with P- values of 0. 000 for Covid-19 daily cases while weather changes had a P- value of 0.004 which are less than 0.05 with coefficients of -0.329 and -0.216 respectively. The results implied that the performance of Nairobi Securities Exchange as measured by NASI decreases when the Covid-19 daily cases increases by one.

Table 2 Correlations

		NASI	Covid-19 daily cases	Weatherchanges
Pearson Correlation	NASI	1.000	-.329	-.216
	Covid-19 daily cases	-.329	1.000	-.530
	Weatherchanges	-.216	-.530	1.000
Sig. (1-tailed)	NASI	.	.000	.004
	Covid-19 daily cases	.000	.	.000
	Weatherchanges	.004	.000	.
N	NASI	154	154	154
	Covid-19 daily cases	154	154	154
	Weatherchanges	154	154	154

4.3 Model Summary Results

Table 3 results showed that Covid-19 daily cases and weather changes collectively explained the performance of Nairobi Securities Exchange as measured by NASI as exhibited by an R-squared of 32.0%. These findings revealed that other factors account for 68% of the performance of Nairobi Securities Exchange.

Table 3 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.565[a]	.320	.310	4.04207	.320	35.449	2	151	.000

a. Predictors: (Constant), Weather changes, Covid-19 daily cases

4.4 Analysis of Variance Results

The results in table 4 of analysis of variance exhibited that there was a statistically significant difference between Covid-19 daily cases and NASI in Kenya as indicated by (F (2, 151) = 35.449, with a P- value of 0.000 which is less than 0.05.

Table 4 ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1158.360	2	579.180	35.449	.000[b]
	Residual	2467.092	151	16.338		
	Total	3625.452	153			

a. Dependent Variable: NASI

b. Predictors: (Constant), Weatherchanges, Covid-19 daily cases

The multiple regression model results in Table 5 pointed out that Covid-19 daily cases have had a negative and statistically significant effect on the performance of Nairobi securities exchange as measured by NASI; this is illustrated by a P- value of 0.000 which is less than 0.05. The results implied that Covid-19 daily cases do affect the performance of Nairobi securities exchange market in Kenya as measured by NASI.

The weather changes results had a negative and statistically significant effect on NASI as exhibited by a P-value of 0.000 which is less than 0.05 implying that weather changes affect the performance of Nairobi Securities Exchange.

Table 5 Coefficients[a] of Determination

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Correlations
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order
1	(Constant)	170.644	4.923		34.662	.000	160.917	180.371	
	Covid-19 daily cases	-.013	.002	-.616	-7.784	.000	-.016	-.010	-.329
	Weatherchanges	-1.652	.241	-.542	-6.848	.000	-2.128	-1.175	-.216

a. Dependent Variable: NASI

5. DISCUSSIONS

The multiple regression model results in Table 5 pointed out that the Covid-19 daily cases had a negative and statistically significant effect on the performance of Nairobi securities exchange as measured by NASI. The results support the work of Ngwakwe (2020) who used differential analysis to examine the effect of COVID-19 Pandemic on the selected stock indexes specifically the Shanghai Composite Stock Index (for China); the Euronext 100 (for EU); the Dow Jones Industrial Average and S&P 500 (for the United States). Stock market index data on these four stock indexes were collected for fifty days before and within COVID-19 pandemic. Applying the t-test of difference in mean stock values, the findings from the analysis indicated a significant effect of COVID-19 pandemic on two stock indexes – the Shanghai Composite Index and the Dow Jones Industrial Average. The Shanghai Composite Index showed resilience to COVID-19 pandemic with a significant gain in stock values during the first fifty days into the pandemic. On the contrary, the Dow Jones Industrial Average experience adverse impact from the COVID-19 pandemic with a significant loss of stock market value on its index during the first fifty days into the COVID-19 pandemic. Even though the difference in stock values during the COVID-19 pandemic for Euronext 100 and the S&P 500 were not statistically significant, their mean stock index values exhibited a decline in value during the sample period of the first fifty days within COVID-19 pandemic. Additionally, Ngwakwe findings also showed that all the four stock market indexes experienced a higher degree of stock value volatility during the first fifty days within the COVID-19 pandemic.The results of the study are also in line with the work of Nuhu (2020) who investigated the impact of the COVID-19 on thefinancial markets from 1st March 2020 to 25th March 2020 in China and USA by applying a simple regression model.Time series data from China COVID-19 Statistics Reports andTrading Economics for China and USAwere employed by the study. The study used the Shanghai Stock Exchange as asample for China and the New York Dow Jones as a sample for the USA. The COVID-19 confirmed cases were the independentvariable while Shanghai Stock Exchange and New York Dow Jones weredependent variables of the study in China and USA respectively. The study findings revealed that there is a positivesignificant relationship between the COVID-19 confirmed cases and all thefinancial markets (Shanghai stock exchange and New York Dow Jones) from 1stMarch 2020 to 25th March 2020 in China and USA implying that COVID-19impacted the financial markets from 1st March 2020 to 25thMarch 2020 in China and USA.

The weather changes results had a negative and statistically significant effect on the performance of Nairobi Securities Market Exchange. The findings of this study are consistent with the work of Kang, Jiang, Lee & Yoon (2010) that assimilated diverse weather variables so as to scrutinize if weather conditions affected the security returns in Shanghai securities market for the period spanning January 1996 to December 2007. As regards the local securities market investors, extremely high humidity and extremely low sunshine along with extremely low temperature and extremely low humidity were negatively significant on the stock returns. In relation to the foreign investors, extremely high humidity, extremely low humidity and extremely high sunshine, extremely high temperature and extremely high humidity and, finally, extremely low humidity and extremely high sunshine affected positively the volatility of stock returns. Their findings showed that investors were influenced by different types of weather variables which may affect the security returns and instability. The findings from the study contradicted with the work of Wang, Shih & Jang (2018) who studied the association between weather effects, investors' moods and stock market risk in Taiwan, Japan and Hong Kong. Three weather variables, namely temperature, humidity, and cloud cover were selected to test the influence of weather changes on returns and volatilities of the stock market. Additionally, their study also investigated the market trends under weather effects. The empirical findings of the study indicated that the effect of the weather on the stock market was insignificant and could not be differentiated between market developments; nevertheless, the weather had an influence on the volatilities of the securities market

6. CONCLUSION

Coronavirus pandemic epitomizes a terrifying and unusual risk, causing a pronounced challenge to investors, policy makers and individuals. The study is among the very few that have investigated the effect of Covid-19 daily cases on the performance of the securities exchange. The study applied linear regression analysis model to find out the effect of Covid-19 dailycases on the performance of securities exchange as measured by NASI. The study findings revealed that Covid-19 daily cases and weather changes had a negative and statistically significant effect on the performance of Nairobi securities exchange as measured by NASI. The results inferred that Covid-19 daily cases have affected the performance of Nairobi Securities market since the announcement of the first Coronavirus case in Kenya.

The findings from this study are useful for policy implications as it provides guidance to policy makers to institute applicable policy reactions in line with the course of current coronavirus pandemic or during future pandemics of similar nature.

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