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STOCK MARKET REACTION TO INTRODUCTION OF FINANCIAL DERIVATIVES IN NIGERIA

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ABSTRACT

This study investigates the impact of stock futures introduction on stock prices in Nigeria, using the event study methodology. Focusing on seven SEC-approved stock and index futures between 2020 and 2022, the research examines cumulative abnormal returns (CARs) around the announcement period. Results reveal negative CARs within the (0, +1) window, indicating that initial disclosures conveyed negative signals, leading to stock sell-offs consistent with signaling theory. However, CARs within the (+2, +16) window were positive and statistically significant, suggesting that subsequent market perceptions improved, possibly reflecting more favorable information. These findings highlight the importance of transparency and strategic communication by firms during and after such announcements to influence investor confidence positively. The study contributes to the literature on derivatives in emerging markets and provides insights for policymakers, firms, and investors on the informational effects of financial innovations in Nigeria.

KEYWORDS: Abnormal Returns; Event Study; Event Window; Financial Derivatives; Index Futures; Parameter Estimation; Stock Futures.

INTRODUCTION

Stock markets play a crucial role in economic development by facilitating capital formation and reflecting corporate performance through stock prices. Market efficiency, as defined by Fama (1970), requires that prices quickly incorporate new information In Nigeria, although research has covered various aspects of financial derivatives, there is a lack of empirical studies examining the introduction of stock futures as a market-moving event. In 2021, the Nigerian Securities and Exchange Commission (SEC) approved stock futures for firms like Access Bank Plc, Dangote Cement Plc, and Guaranty Trust Bank Plc. These instruments, while expected to enhance market depth and investor participation, have not been thoroughly investigated in terms of their actual effect on stock prices. This study gap will address the following research objectives:

Research Objectives

1. To Investigating the market reaction to the introduction of single stock futures.
2. To Examining investor perception and response to these instruments.

Given the observed volatility in the Nigerian stock market from 2017 to 2021, understanding the effect of derivatives becomes even more critical. This study specifically seeks to determine the following research questions:

Research Questions

1. Whether the introduction of stock futures significantly affects stock prices.
2. The cumulative abnormal returns (CARs) on the announcement day and during the 15-day post-announcement period.

To answer the above questions, the following research hypotheses have been formulated

Research Hypotheses

H_{01}: Stock future introduction has no significant effect on stock prices of the listed approved firm's cumulative abnormal returns on the announcement date.

H_{02}: Stock future introduction has no significant effect on stock prices of the listed approved firm's cumulative abnormal returns fifteen trading days after the announcement date.

Scope of the Study

This study examines how stock prices respond to the introduction of derivatives specifically stock futures and index futures in Nigeria from 2020 to 2022, covering all Securities and Exchange Commission (SEC) approved contracts traded on the NGX.

LITERATURE REVIEW

Introduction

Financial markets globally have witnessed significant transformations with the introduction and proliferation of derivative products. Sophisticated financial instruments such as single stock futures (SSFs), index futures, and derivative warrants (DWs) have reshaped market dynamics, providing both opportunities and challenges for investors and policymakers. This review synthesizes key studies that examine the impact of derivatives trading on various financial markets, highlighting the complex relationships between derivatives and their underlying assets.

EMPIRICAL REVIEW

Strong (2016) examined the impact of SSFs on the options market and found a complementary relationship between the two products. The availability of SSFs was shown to increase options trading activity, contrary to conventional expectations, suggesting that SSFs can enhance options market liquidity and provide improved risk management and hedging opportunities.

Malik and Shah (2016) studied the volatility dynamics of underlying stocks following the resumption of SSF trading on the Karachi Stock Exchange (KSE). Their findings indicated that volatility changes were driven by broader market, industry, or macroeconomic factors, rather than by SSF trading itself. This underscores the need to consider wider market conditions when analyzing derivatives' effects.

Karanja (2017) investigated the effects of SSFs on stock return volatility in the Indian stock market. The study revealed significant variability in impact across different stocks, with some exhibiting substantial effects while others remained relatively stable. This highlights the nuanced and stock-specific nature of derivatives' impact on individual securities.

Malik and Shah (2017) also assessed the potential destabilizing effects of SSFs on equities in Pakistan. Contrary to common concerns, their study found no significant differences in market efficiency and volatility between SSF and non-SSF equities, suggesting that SSFs do not necessarily destabilize the underlying stocks.

Shankar et al. (2018) analyzed factors influencing mispricing in SSFs on the National Stock Exchange of India. They found that mispricing increased as liquidity decreased, with futures market liquidity having a greater impact on mispricing than the spot market. This finding emphasizes the critical role of liquidity in ensuring efficient pricing in derivatives markets.

Boney et al. (2018) explored the pricing relationship between SSFs and underlying spot securities, focusing on the Dow Jones Industrial Average (DJIA). Their study showed that the spot market dominates the SSF market, contributing approximately 70% to the price discovery process. This illustrates the significant interplay between spot and derivative markets in asset pricing.

Malik and Shah (2019) further explored the impact of SSFs on market stability in Karachi, Pakistan. Their analysis suggested that SSF introductions did not disrupt the underlying stocks and might benefit market liquidity. However, they cautioned against generalizing these findings due to a limited sample size, advocating for further research.

Tram (2020) examined the impact of index futures introduction on the Vietnamese stock market's volatility. The study reported a notable increase in market volatility following the introduction of index futures, raising concerns about market stability. However, the focus on volatility alone limits a comprehensive understanding of futures' broader market effects.

Ausloos et al. (2021) studied the effect of index futures trading on spot price volatility in the China-Shanghai-Shenzhen-300-Stock Index (CSI 300). They found that volatility decreased significantly following the introduction of index futures, suggesting improved market stability. Nonetheless, criticisms regarding the study's methodology and sample size indicate the need for further validation.

Jalal-Eddeen and Saleh (2022) reviewed the evolution of financial derivatives, emphasizing their growing importance across sectors. However, their review lacked in-depth analysis and actionable recommendations, limiting its practical utility for stakeholders.

Augustin et al. (2023) analyzed the introduction of Bitcoin futures and their impact on the cryptocurrency spot market. The study identified enhanced market integration, liquidity, and pricing efficiency following the introduction of futures contracts. However, its applicability to traditional financial markets is limited due to its narrow focus on crypto currencies and a short observation period.

THEORETICAL FRAMEWORK

Signaling Theory

This study employs Signaling Theory to examine the impact of stock futures introduction in Nigeria. The theory, formalized by Spence (1973), explains how informed parties (firms and regulators) send credible signals to less-informed investors to reduce information asymmetry. Effective signals are credible, observable, consistent, and costly to imitate.

Connelly et al. (2011) highlight five elements that strengthen signals: observability, credibility, cost, frequency, and consistency. In this context, the announcement of stock futures serves as a strategic signal indicating market maturity, increased transparency, and reduced information gaps.

Overall, Signaling Theory provides a framework for assessing how investors perceive and react to stock futures announcements, as reflected in stock price movements and market efficiency.

RESEARCH METHODOLOGY

Research Resign

This study adopts a correlational research design to examine the relationship between the announcement of stock futures introduction and stock return behavior on the Nigerian Exchange (NGX), as recommended by Kumar (2005). The population comprises the seven stock and index futures approvals granted by the Nigerian Securities and Exchange Commission (SEC) as of July 28, 2021.The sample includes all seven approvals, selected based on criteria such as: Availability of daily share prices during the study period, absence of other major announcements that could affect stock prices, data Collection relies on secondary sources, specifically, Daily stock prices of the firms involved, the NGX All Share Index (ASI),data is sourced from investing.com and Cash Smart Asset Management Limited, this methodology enables the study to analyze market reactions to the introduction of derivatives within Nigeria's financial landscape.

Table 1 Variable Measurements.

Variable	Variable Description/ Measurements	Source
announcement day Abnormal Return	Measured the abnormal returns for day 0, and day +1 that is announcement days	Woon, (2004).
Post announcement day Abnormal Return	Measured the abnormal returns from day +2 to day +16 that is 15trading days after the announcement	Woon, (2004).

Source: Authors compilation 2023

VARIABLE MEASUREMENTS AND DATA ANALYSIS TECHNIQUES

The study measures abnormal returns on the announcement day (day 0 and +1) and for 15 post-announcement trading days (day +2 to +16). To address potential non-stationarity in financial time series data, unit root tests will be conducted using the Augmented Dickey-Fuller (ADF), Phillips-Perron (PP), and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests, as recommended by Greene (2003) and Agung (2008). For data analysis, the event study methodology by Mackinlay (1997) will be applied to assess the impact of stock and index futures introduction on Nigerian firms. This includes converting daily prices into continuously compounded returns and analyzing within a 32-day event window (15 days before and after the announcement). A 120-day estimation window will establish benchmark returns, with thin trading adjustments following Miller et al. (1994). Abnormal returns will be estimated using the market model (Fama et al., 1969). Cumulative Abnormal Returns (CAR) and Cumulative Average Abnormal Returns (CAAR) will be calculated, and significance tested using the t-test. A significant t-value indicates a meaningful market reaction. The expanded event window captures delayed market responses, ensuring comprehensive analysis aligned with prior studies on the Nigerian Exchange.

RESULTS AND DISCUSSIONS

The study conducted diagnostic and specification tests on continuously compounded returns for seven sample firms, covering a 120-day estimation window and a 32-day event window. Stationarity tests, such as Augmented Dickey-Fuller, Phillips-Perron, and Kwiatkowski-Phillips-Schmidt-Shin tests, were performed on 152 returns. Results for both sample firms and market returns are presented in Table 1, along with descriptive statistics of abnormal returns, sample average abnormal return, and cumulative abnormal return.

Table 1 Stationarity Test Results for Firm Returns.

Firm	ADF Statistics	PP Statistics	KPSS Statistics	Order of Integration	Stationarity
Access Bank	-11.76***	-11.76***	0.13	I(0)	Yes
Dangote Cement	-13.57***	-13.51***	0.10	I(0)	Yes
GTBank	-11.84***	-14.77***	0.10	I(0)	Yes
MTN	-11.45***	-11.43***	0.15	I(0)	Yes
NGX30 Index	-10.55***	-10.83***	0.20	I(0)	Yes
NGX Pension Index	-10.82***	-10.95***	0.15	I(0)	Yes
Zenith Bank	-11.90***	-11.90***	0.09	I(0)	Yes

Source: Eviews 8.0 output, 2023

All seven firms' return series were stationary at levels based on Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) tests, rejecting the unit root null hypothesis at the 1% significance level. Results from the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test were consistent, confirming stationarity. In contrast, market return series did not demonstrate stationarity according to tests in Table 2. These results affirm the suitability of firm return series for subsequent analysis.

Table 2 Stationarity Test Results for Market Returns.

Firm	ADF Statistics	PP Statistics	KPSS Statistics	Order of Integration	Stationarity
Access Bank	-6.23***	-10.59***	0.34	I(0)	Yes
Dangote Cement	-6.23***	-10.59***	0.34	I(0)	Yes
GTBank	-6.23***	-10.59***	0.34	I(0)	Yes
MTN	-6.23***	-10.59***	0.34	I(0)	Yes
NGX30 Index	-6.23***	-10.59***	0.34	I(0)	Yes
NGXPension Index	-6.23***	-10.59***	0.34	I(0)	Yes
Zenith Bank	-6.23***	-10.59***	0.34	I(0)	Yes

Source: Eviews 8.0 output, 2023

Table 2 displays consistent stationarity results for market returns across all seven firms during the investigation periods. Augmented Dickey-Fuller (ADF), Phillips-Perron (PP), and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests indicate stationary market return series at the 1% significance level, confirming I(0) integration. This justifies the use of Ordinary Least Squares (OLS) for estimation, enhancing regression analysis accuracy. The consistent stationarity findings bolster data reliability and align with asset pricing theories.

Table 3 Event Window Market Model Regression Results.

Futures	Intercept	Coefficient	R^2	Estimation Method
Access	0.689135	0.310322	0.018	OLS
Dangote Cement	-0.677747	1.677324	0.291	OLS
Gtbank	0.529556	0.469007	0.028	OLS
Mtn	0.022282	0.977465	0.292	OLS
Ngx30 index	0.016209	0.983603	0.844	OLS
Ngx pension	0.357726	0.642399	0.432	OLS
Zeneith bank	-0.083901	1.083013	0.143	OLS

Source: Eviews 8.0 output, 2023

The analysis reveals that most firms and indices exhibit positive average values for event window returns, with only two entities displaying negative averages. Coefficients for all entities in both simple and continuous compounding returns are positive, indicating a direct positive relationship between market returns and individual entities. The coefficient of determination ranges from 1.8% to 84.4%, suggesting varying degrees of market return explanation for individual entity returns. Ordinary Least Squares (OLS) is consistently employed for estimating market regression models, as no substantial autoregressive behavior necessitates alternative models like ARCH/GARCH. This underscores the suitability and validation of the OLS approach across all models.

Table 4 Event Window Descriptive Statistics.

	AR	CAR	AAR	CAAR
Mean	0.0000	-0.0059	0.0000	-0.0008
Maximum	0.0761	0.0440	0.0109	0.0063
Minimum	-0.0704	-0.0655	-0.0101	-0.0094
Std. Dev.	0.0259	0.0310	0.0037	0.0044
Skewness	0.2011	-0.1953	0.2011	-0.1953
Kurtosis	4.9065	1.9409	4.9065	1.9409
Jarque-Bera	5.0620	1.6992	5.0620	1.6992
Probability	0.0796	0.4276	0.0796	0.4276
Obs	32	32	32	32

Source: Eviews 8.0 output, 2023

Table 4 depicts abnormal return metrics during the event window, highlighting minimal average impact post-derivatives introduction. Mean abnormal return is close to zero, with wide variability and left skewness, indicating non-normality. Cumulative abnormal return similarly exhibits non-normal distribution. Conversely, average abnormal return suggests limited average impact, with positive skewness. Cumulative average abnormal return reflects minimal average benefit, with negative skewness, rejecting normality assumptions. Overall, these findings emphasize the non-normal nature of cumulative average abnormal return series.

Table 5 Estimation Window Descriptive Statistics.

	ARS	CAR	AAR	CAAR
Mean	0.0000	-0.2109	0.0000	-0.0301
Maximum	0.1421	0.0000	0.0203	0.0000
Minimum	-0.1375	-0.5114	-0.0196	-0.0731
Std. Dev.	0.0439	0.1102	0.0063	0.0157
Skewness	-0.2036	0.0016	-0.2036	0.0016

Kurtosis	4.3074	2.8772	4.3074	2.8772
Jarque-Bera	9.3751	0.0755	9.3751	0.0755
Probability	0.0092	0.9630	0.0092	0.9630
Obs	120	120	120	120

Table 5 analyzes abnormal return and cumulative abnormal return series during the event estimation window, revealing minimal average impact with high variability and left-skewed distribution. Both series reject normality assumptions, while average abnormal return indicates minimal impact with negative skewness. Cumulative average abnormal return shows a slight average loss, rejecting normal distribution assumptions, highlighting non-normal distribution and variability during this period.

Table 6 Event Window Abnormal Return and Test Statistics.

Day	Z	t(AR)	CAR	t(CAR)	AAR	t(AAR)	CAAR	t(CAAR)
-15	0.0133	2.1079***	0.0133	2.1079***	0.0019	0.3011***	0.0019	0.3011***
-14	-0.0107	-1.6928	0.0026	0.4151	-0.0015	-0.2418	0.0004	0.0593
-13	0.0110	1.7524	0.0137	2.1675*	0.0016	0.2503	0.0020	0.3096
-12	0.0157	2.4914**	0.0294	4.6590***	0.0022	0.3559	0.0042	0.6656
-11	0.0076	1.2101	0.0370	5.8691***	0.0011	0.1729	0.0053	0.8384
-10	-0.0298	-4.7295***	0.0072	1.1396	-0.0043	-0.6756	0.0010	0.1628
-9	0.0281	4.4671***	0.0353	5.6066***	0.0040	0.6382	0.0050	0.8009
-8	-0.0076	-1.2047	0.0277	4.4019***	-0.0011	-0.1721	0.0040	0.6288
-7	0.0018	0.2925	0.0296	4.6944***	0.0003	0.0418	0.0042	0.6706
-6	-0.0048	-0.7575	0.0248	3.9369***	-0.0007	-0.1082	0.0035	0.5624
-5	-0.0036	-0.5664	0.0212	3.3705***	-0.0005	-0.0809	0.0030	0.4815
-4	-0.0028	-0.4431	0.0184	2.9274***	-0.0004	-0.0633	0.0026	0.4182
-3	0.0076	1.2100	0.0261	4.1374***	0.0011	0.1729	0.0037	0.5911
-2	-0.0288	-4.5680***	-0.0027	-0.4306	-0.0041	-0.6526	-0.0004	-0.0615
-1	-0.0054	-0.8550	-0.0081	-1.2856	-0.0008	-0.1221	-0.0012	-0.1837
0	0.0078	1.2417	-0.0003	-0.0439	0.0011	0.1774	0.0000	-0.0063
+1	-0.0203	-3.2216***	-0.0206	-3.2655***	-0.0029	-0.4602	-0.0029	-0.4665
+2	-0.0291	-4.6216***	-0.0497	-7.8872***	-0.0042	-0.6602	-0.0071	-1.1267
+3	-0.0158	-2.5046**	-0.0655	-10.3918***	-0.0023	-0.3578	-0.0094	-1.4845
+4	0.0302	4.7948***	-	-5.5970***	0.0043	0.6850	-	-0.7996

			0.0353				0.0050	
+5	-0.0299	-4.7464***	-0.0652	-10.3434***	-0.0043	-0.6781	-0.0093	-1.4776*
+6	0.0331	5.2469***	-0.0321	-5.0965***	0.0047	0.7496	-0.0046	-0.7281
+7	0.0761	12.0785***	0.0440	6.9820***	0.0109	1.7255**	0.0063	0.9974
+8	-0.0704	-11.1744***	-0.0264	-4.1924***	-0.0101	-1.5963*	-0.0038	-0.5989
+9	-0.0108	-1.7066	-0.0372	-5.8991***	-0.0015	-0.2438	-0.0053	-0.8427
+10	0.0067	1.0647	-0.0305	-4.8343***	0.0010	0.1521	-0.0044	-0.6906
+11	0.0071	1.1270	-0.0234	-3.7073***	0.0010	0.1610	-0.0033	-0.5296
+12	0.0083	1.3116	-0.0151	-2.3957**	0.0012	0.1874	-0.0022	-0.3422
+13	-0.0226	-3.5806***	-0.0377	-5.9764***	-0.0032	-0.5115	-0.0054	-0.8538
+14	0.0050	0.7914	-0.0327	-5.1850***	0.0007	0.1131	-0.0047	-0.7407
+15	-0.0035	-0.5486	-0.0361	-5.7336***	-0.0005	-0.0784	-0.0052	-0.8191
+16	0.0361	5.7336***	0.0000	0.0000	0.0052	0.8191	0.0000	0.0000

On day 0, a significant positive abnormal return (AR) occurred (t(AR) = 1.2417), while cumulative abnormal return (CAR) was non-significant (t(CAR) = -0.0439). Days +1 to +16 saw negative abnormal returns, peaking at day +9 (-0.0372, t = -5.8991), reflected in consistently negative CAR.

T-tests assessed abnormal returns' significance over two periods: two days surrounding the announcement and 15 days following it, aiding in understanding the announcement's impact on stock returns.

Table 7 Results for the Test of Hypothesis one.

Details		**Values**
Cumulative Abnormal Return (0, +1)		-0.0125
Estimation Window Standard Deviation Of Average Abnormal Return		0.0063
t – Statistic		-1.9841
Degrees of Freedom (N – 1)		1
Tabulation values	1%	31.8205
	5%	6.3138
	10%	3.0777

For Hypothesis One, the calculated t-statistic for cumulative abnormal return (CAR) during the period (0, +1) was -1.9841, falling within the critical region at the 5% significance level but not at the 1% level. This suggests no statistical difference from zero at 5% significance, but potential significance at the 10% level. The observed CAR of -0.0125 indicates no significant abnormality during the announcement and following day regarding derivatives introduction, though there's suggestive evidence at the 10% significance level. Caution is advised in drawing strong conclusions, indicating a need for further analysis and consideration of additional factors to understand market response dynamics.

Table 8 Results for the Test of Hypothesis two.

Details			**Values**
Cumulative Abnormal Return (+2, +16)			0.0206
Estimation Window Standard Deviation Of Average Abnormal Return			0.0063
t – Statistic			3.2655
Degrees of Freedom (N – 1)			14
Tabulation values	1%	2.6245	
	5%	1.7613	
	10%	1.3450	

Hypothesis Two's t-test showed a significant cumulative abnormal return (CAR) from day +2 to day +16 (CAR = 0.0206, t = 3.2655). The calculated t-statistic falls within critical regions at 1%, 5%, and 10% significance levels, indicating rejection of the null hypothesis. This suggests that abnormal returns during this period following the derivatives announcement are statistically different from zero, highlighting a more pronounced impact in the days subsequent to the.

CONCLUSION AND RECOMMENDATION

The study's first objective revealed negative cumulative abnormal returns (CARs) within the window (0, +1), in line with signaling theory. This indicates that firms' actions or disclosures during this period conveyed negative information, prompting downward revisions in investor expectations and subsequent stock sell-offs, consistent with prior research by Sadikin (2016), Nur and Dadan (2017), Warren and Sorescu (2017). Conversely, Objective two findings demonstrated positive CARs within the window (+2, +16), also consistent with signaling theory. Despite a non-statistically significant t-statistic for simple compounding returns, the positive CAR suggests that the firm's actions or disclosures during this period may have conveyed positive information, potentially leading to increased stock prices, supported by

studies from Kelten and Aybars (2022), Ma et al. (2009), Mushidzhi and Ward (2004), and Brown and Kim (1993). Based on Objective one's findings, which indicate negative CARs within the window (0, +1), firms should prioritize enhancing transparency and clarity in corporate disclosures. By providing clear and timely information to the market, firms can empower investors to make more informed decisions and potentially mitigate negative reactions associated with unfavorable signals. Conversely, Objective two's findings suggest that firms should continue focusing on effectively conveying positive information to the market within the window (+2, +16). This involves maintaining open communication channels with investors and providing regular updates on strategic initiatives and financial performance, fostering investor confidence and potentially attracting more favorable market reactions.

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