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SECTORAL BUBBLES IN THE NIGERIAN EXCHANGE GROUP: EVIDENCE AND INSIGHTS

Daniel Dornubari Sunday
Department of Maritime Economics and Finance,
Nigeria Maritime University, Delta State, Nigeria
daniel.Sunday@nmu.edu.ng

Omiete Victoria Olulu-Briggs
Department of Finance and Banking,
University of Port Harcourt, Nigeria
omiete.olulu-briggs@uniport.edu.ng

Abstract
This study investigated the existence of sectoral bubbles in the Nigeria Exchange Group using monthly data over the period 2007:M01 – 2023:M12. The study specifically examines the stock returns of six different NGX indices, namely NGX 30, NGX 50, NGX Industrial, NGX Consumer Goods, NGX Oil and Gas, and NGX Premium to detect the presence of bubbles. This collaborates with the motivation to verify the resiliency of specific sectors within the Nigerian Exchange Group in response to the contagion effects of the global financial crisis of 2007-2008, the bubble of 2012-2014, and the events of April 2017, as identified by the Central Bank of Nigeria. The research collected data from many sources, including the Central Bank of Nigeria, Nigeria Bureau of Statistics, and the Nigerian Exchange Group statistics bulletins. The research used descriptive statistics and the generalized backwards supremum augmented Dickey-Fuller (BSADF) date-stamping procedures at a 95% confidence interval to examine the data. The investigation revealed the existence of several bubbles in many indices, including NGX 30, NGX 50, NGX Industrial, NGX Consumer Goods, NGX Oil and Gas, and NGX Premium. The investigation determined that there are several bubbles present in all of the studied sectors of the Nigerian Exchange Group. Among others, the study recommended that the Nigerian Exchange Group should actively participate in investors' education. When there is increasing awareness of the dangers associated with bubbles, it will aid in preventing irrational enthusiasm. Also, investors who has higher level of education are known to be more inclined to make well-informed decisions and are less likely to contribute to the emergence of speculative bubbles.

Keywords: Contagion, Volatility, Investors, SADF, Stock Prices.

Introduction

The Nigerian Exchange Group (NGX) at various stages has witnessed either a sharp or mild instability in price of securities or assets resulting in unswerving or subtle fall or surge constituting the phenomenon called market bubbles. According to Almudhaf (2018), Gemici et al. (2023), Kyriazi et al. (2020), bubbles are mainly characterised by remarkable additions in the prices of financial assets or a variety of assets in a continuous phase such that a previous price "surge" creates more expectations for prices to "surge", which attracts fresh investors. This phenomenon according to Igbinovia and Igbinovia (2019) are attributed to the significant increase of share prices not having the required substantiation for the sound financial and economic foundation. These inefficiencies in the market often lead to negative consequences like prolonged recession as well as significant economic losses (Narayan et al., 2013; Jorda et al., 2015). This condition leaves into a bubble burst condition. A bubble burst is an economic phenomenon characterised by a rapid decline in value or a contraction in the value of assets. This is due to the behaviour of the market, which brings the price of the assets down to a level that is well below their true value. According to Iliyasu et al. (2021), when there is a burst in a bubble, there will be a significant reduction in the values of the assets which will lead to the loss of wealth.

There have been several instances of the incidence of economic bubbles in Nigeria. For instance, the global financial crisis bubble that started in the US real estate market in 2007/2008 and subsequently spread to other economies including Nigeria as a result of interdependence of global markets. This incidence resulted in the significant decline of value of the foreign holdings in Nigeria, having to converting their stock investment into cash for repatriation purposes (Igbinovia and Igbinovia, 2019). Similarly, before the Nigerian recession in August 2016, the Central Bank of Nigeria (2017) had stated its concern over a "seeming bubble" in the NGX. This concern resulted from the growing market capitalisation which was not supported by any clear underlying fundamental factors to explain it. This phenomenon attracted a considerable number of researches in Nigeria such as Iliyasu et al (2020), Igbinovia and Igbinovia (2019) and Iliyasu et al (2021) who have conducted their investigations on the existence of the bubbles in the NGX. These researchers were able to confirm the existence of bubbles in the NGX; whereas, the result of Iliyasu and Saba (2019) could not confirm their existence. The discussion in the area of economics on the presence of financial bubbles remains very intriguing. After a thoroughly analysis from an enormous comprehensive literature, it was clear that there is no definitive evidence on the presence of bubbles in any particular sector of the NGX. As such, the researchers are investigating this particular aspect of the NGX.

Previous study that Omoruyi et al. (2017), Iliyasu et al. (2020), Iliyasu et al. (2021) and Olulu-Briggs and Sunday (2023) have mainly focused on the existence of bubbles within the Nigerian economy on a macroeconomic level. The above analysis often does not take into account the different effects of bubbles on different sectors in the Nigerian Exchange Group. According to Olulu - Briggs and Sunday (2023) sectoral perspective is missing in this research may lead to a reductionist understanding of the complex features of bubbles amongst different areas of the Nigerian Exchange Group. Therefore, in this research, it tests for bubbles across several sectors in the NGX which includes NGX 30, NGX 50, NGX

Industrial, NGX Consumer goods, NGX Premium and NGX oil and gas in order to ascertain those sectors that have actually encountered bubbles. The impetus for researching each of the indices has been the need for investors, regulators, and policy makers to determine the relative resilience of these indices to the contagion effects of significant events such as the 2008/2009 global financial crisis and the apparent bubbles in 2017.

Likewise, the current body of literature does not show much consensus as to what exactly determines the emergence of economic bubbles. There is contention among scholars that it could be attributed to noise trading, which refers to the inclusion of information that has not been integrated into the market. Moreover, some hold the opinion that the phenomenon might be ascribed to the practise of buying stock on margin, difficulty in taking a short position in the stocks, the use of put option to go short, the overconfidence of investors, calendar effect and fluctuation in political environment as well. This controversy has drawn the attention of a number of empirical studies (Olulu-Briggs and Sunday, 2023; Iliyasu et al., 2021; Iliyasu et al., 2020; Iliyasu and Saba, 2019; Omoruyi et al., 2017) with conflicting results. For example, the study by Olulu - Briggs and Sunday (2023) and Ahmed and Ahmad (2022) show the existence of multi - bubble, and the study by Iliyasu and Saba (2019) shows the absence of bubble. The existence of conflicting results could possibly be attributed to differences in research procedures, geographical reaches or data sources, hence imperilling the quest to create a uniform and all-encompassing understanding of the matter (Natchimuthu, 2022). Thus, this research tests for the existence of sectoral bubbles of the Nigerian Exchange Group using monthly from January, 2008 to December 2023 with the use of Generalised Supremum Augmented Dickey - Full l (GSADF) model.

2.Literature Review

2.1.1 Bubbles

Highly in return, Almuthaf (2018) defines bubbles as some noticeable increase in the prices of financial asset or some asset in a continuous way. This initial price surge leads to the expectation of future price increases which in turn brings new investors. According to Igbinovia and Igbinovia (2019), the phenomenon under this consideration is attributed to the significant increase in share prices without the required substantiation for sound financial and economic foundations. The existence of these inefficiencies in the market has been observed to lead to adverse effects such as lengthy recession period and massive economic losses (Narayan et al., 2013; Jorda et al., 2015). The non-financial and non-economic factors that may affect these results include investing style, the calendar effect, market manipulating, access to inside information, overconfidence on the part of investors, noise and fluctuation in the political environments (Asekome and Agbonkhese, 2015; Olulu Briggs and Sunday, 2023). According to Aigbovo, Ozekhome, and Isibor (2017), the emergence of bubbles could be explained by the confidence of investors which is based on the fact that they believed that assets would always experience an appreciable increase in the demand for these assets. It is this belief that gives rise to the anticipation that there will be lucrative capital gains and dividends in the foreseeable future.

2.2 Theoretical Framework

This analysis is based on the Greater Fool Theory of Bubbles propounded by Kindleberger (1978) which suggests that individuals have the ability to create gains by acquiring assets that are overvalued indicating that their purchase price is much in excess of their inherent worth. This is based on the ability to sell in the future these assets for a higher price. In the given context, a person with little knowledge of the topic, might purchase something of worthless value and use it to sell to a party with a better grasp of the situation at hand, thus earning a financial gain. The effectiveness of this method depends on the existence of a large number of individuals, newly arrived, who will be willing to pay higher and higher prices for buying the commodity. Investors have to recognise in the final analysis that the price is simply not in line with reality anymore. As a result, it is possible for a sell-off to take place that leads to a profound fall in the price till it converges for its equitable value, possibly to zero (Abreu and Brunnermeier 2003).

The theory has two basic assumptions. Firstly, it makes assumptions that there will always be a person who is willing to pay more for some asset because of just intrinsic value. Secondly, it assumes that the investor has the capacity to sell the item before its price concludes in accordance with its actual worth. This implies that there is an investor who has access to the ability to profit from assets that are being viewed as being overpriced based on the existence of yet another investor who is frequently referred to as a "greater fool" who is willing to do so at a higher valuation. The tendency for speculating transcends the normal methods of evaluation, e.g. studies of the traditional attributes of an asset or its intrinsic value.

2.3 Empirical Review

Gupta et al. (2024), whether stock market bubbles could be used to forecast the future volatility in oil price returns using monthly information between 1973 and 2020 for the G7 countries. The study utilised the multi-scale log periodical power law singularity confidence indicator. The results of this study found that stock market bubbles can predict the degree of realised volatility in a fairly short to medium term forecast time.

In their study, Acharya (2024) explored the performance of the GSADF test in identifying subtle explosive patterns and speculative bubbles in individual stocks of the S&P 500 in comparison with the Sup Augmented Dickey - Dickey Fuller (SADF) test. The GSADF test clearly outperforms the SADF test in failing to reject the null hypothesis and demonstrates a better sensitivity and effectiveness in detecting stock bubbles.

Osman et al. (2024) studied the existence of speculative bubbles in four elements of crypto market (Bitcoin, Ethereum, CRIX index, DeFi pulse index). The results of the study showed the existence of multiple unique bubble formations in the virtual market, especially there was a major bubble occurring in the periods of bullish prices of the crypto market in the case of Bitcoin, Ethereum and CRIX.

Hansen et al. 2024 formed bubbles in house prices bubbles form in house prices during the covid 19 covid-19 pandemic. The study centred on 382 metropolitan areas in the U.S. and examined specifically the impact of population density. The bubble tests show some evidence of substantial increases in housing prices during the Covid-19 pandemic, though there are some notable variations across different areas.

Shaikh et al. (2023) investigated the existence of speculative bubbles on a variety of emerging markets including China, Indonesia, Malaysia, Pakistan, Taiwan, South Korea, India and Philippines, and Thailand. Using the GSADF technique, this study found the presence of bubbles in Malaysia, Pakistan, China, Indonesia, Thailand and Taiwan, while none occurred in South Korea, India and the Philippines.

Olulu Briggs and Sunday (2023) performed an analysis of several bubble periods from monthly data on the All Share Index from January 1985 through December 2021. GSADF indicated the presence of bubbles in Nigerian Exchange Group.

In the study, Ansari-Samani and Aminian-Dehkordi (2022) have studied the relationship between information risk, including risk of volatility and risk of arbitrage, and price bubbles probability in the stocks of 109 companies trading on the stock exchange between 2011 to 2017. The study used GSADF test and found the presence of bubbles at the exchange.

Natchimuthu (2022) discussed on the presence of bubble in the Indian sectoral indices. The study made use of the GSADF test and SADF methods. The study shows that various sectors do not proceed into bubble phenomena at the same time.

Iliyasu et al. (2021) studied using stock market data from 1995 to 2017 about predicating stock market bubbles and bursts. The study used the estimated log-periodic power law model as an indicator for the existence of a bubble before the crash of March 2008. The research document found that there was a regime shift between December 2007 and May 2008 during which the actual crashing date of the NSE bubble occurred.

Iliyasu et al., (2020) analysed the characteristics of bubble in the Nigerian Stock Exchange between 1985 and 2018. The study used the GSADF test. The GSADF test showed the existence of two occurrences of bubbles in the nominal ASI; and three in the real ASI.

Omoruyi, Hassan and Evbaziegbere (2017) investigate the existence of a speculative bubble in Nigerian stock market at the period between 2008Q1 and 2009Q4. The research is based on the use of sequential analytical techniques, that is, unit root tests and cointegration techniques, to determine the occurrence of random walks and underlying fundamental deviations in the asset prices in a particular period. The empirical findings suggest that a speculative bubble existed in the specified period.

3. Methodology

The aim of this research is to acquire new insights and ideas on the features of Nigerian Exchange Group in relation to market bubbles. This study used ex - post facto hypothesising deductive method as there was no data manipulation and statistical hypothesis testing involved. An ex - post facto research method involves the comparison of groups that already display some characteristics on a dependent variable. Therefore, this analysis has relevance with the attributes of bubbles and its impact on the performance of Nigerian Exchange Group. The population of the population of the study includes eighteen (18) indices listed of the National Exchange Group on December 10, 2023 (Nigeria Exchange Group, 2023). This research only considered six specified indices in the Nigerian Exchange Group: NGX 30, NGX 50, NGX Industrial, NGX Consumer goods, NGX - oil and gas and NGX Premium. The reason for this is that data for the specified indices is available at the NGX. This research adopts the purposive sample approach as a sample design to analyse sectoral bubbles within

Nigerian Exchange Group over the period from January, 2007 to December, 2023. The data used in this research are monthly secondary data of the 5 indices that are given. The data were obtained from the database of statistics available on Nigerian Exchange Group. The secondary data source validates the findings in previous research studies carried out by Olulu-Briggs and Sunday (2023) and Iliyasu and Saba (2019).

This is a research based on the Lucas (1978) model to identify the bubbles by positing that individuals as well as the corporations have rational expectations and the economy is in a state of equilibrium. Non-fundamental causes and the prices of a number of assets may cause deviations from this equilibrium. The model applied in this research is based on Lucas (1978) asset pricing model. Thus, the model for this study is declared as

$SETR_t = f(SETR_{t-n})$ 3.2

$SETR_{it} = \alpha_0 + \alpha_1 SETR_{it-n} + \mu_t$ 3.3

$\beta_1 > 0$

Where, $SETR_t$ = Current period sectoral stock return,
$SETR_{t-1}$ = Previous period sectoral stock return,
i = The different represented sectoral stock return,
β_o = Intercept,
α_1 = Constant parameters,
μ_t = Error term.

In analyzing the data collected, this study adopts the descriptive statistics and the generalized supremum augmented Dickey-Fuller (GSADF) test. The GSADF test was first introduced by Philips, et al. (2015) to solve the time stamping issues of the SADF test, and it has proven more powerful than the ADF and SADF test at detecting explosive behavior (Vasilopoulos et al., 2020).

4. RESULTS AND DISCUSSION

Table 4.1 Descriptive Statistic Result

Variables	Mean	Max	Min	Std. Dev	Kurtosis
NGX_OIL_AND_GAS	0.008928	0.197233	-0.639085	0.097519	12.81345
NGX_30	0.011819	0.179827	-0.389340	0.069255	8.433490
NGX_INDUSTRIAL	0.006647	0.292863	-0.199975	0.046966	22.87071
NGX_CONSUMER_GOODS	0.009051	0.215274	-0.269984	0.067675	5.342050
NGX_PREMIUM	0.015199	0.718671	-0.103101	0.021086	17.36382
NGX_50	0.010039	0.231801	-0.105358	0.038498	11.59090

Source: E-view Output 10.0

The monthly returns for the NGX_OilandGas, NGX30, NGX_Industrial, NGX_ConsumerGoods, NGX_Premium and NGX50 are 0.8928%, 1.1819%, 0.6647%, 0.9051%, 1.5199% and 1.0039% respectively. These numbers suggest that, on average, investors will expect monthly gains of the above values for the respective sectors. The range of monthly extreme returns of each sector is the following: NGX_OilandGas (-63.9085% to 19.7233%), NGX30 (-38.9340% to 17.9827%), NGX_Industrial (-19.9975% to 29.2863%), NGX_ConsumerGoods (-17.8195% to 21.5274%), NGX_Premium (-10.3101% to 71.8671%). As a result, the investor could as realistically expect a maximum monthly return of 19.7233%, 17.9827%, 29.2863%, 21.5274%, 71.8671%, and 23.1801% for different sectors respectively. Conversely, should the investment fail to meet expectations, possible losses could be 63.9085%, 38.9340%, 19.9975%, 17.8195%, 10.3101% and 10.5358% in the prescribed order. The accompanying degree of risk of each sector is at a moderate scale, measured as 9.7519%, 6.9255%, 4.6966%, 6.7675%, 2.1086% and 3.8498%. The fact that the kurtosis for all sectors is equal to or larger than three implies a strong peak in the distribution of returns and hence a high level of probability of the occurrence of herding behaviour. Such behavior reinforces the tendency on the part of the participants in the market to imitate the trade in supposedly savvy traders, which re-introduces the idea of the "greater fool" phenomenon and its potential to cause economic bubbles.

Table 4.2 GSADF Result

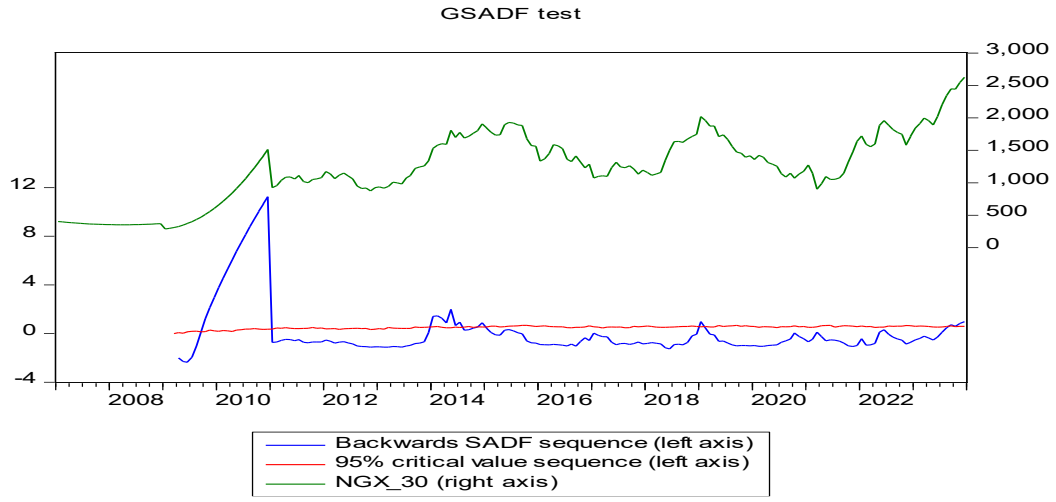
Sectors	GSADF Values	Test	Critical	t-statistic	P-value
NGX_Oil_and_Gas	2.068710			15.85277	0.0000
NGX_Consumer_Goods	2.068710			14.15080	0.0000
NGX_Industrial	2.093451			10.90254	0.0000
NGX_30	2.072372			11.25137	0.0000
NGX_50	2.034854			17.64206	0.0000
NGX_Premium	2.062227			66.77278	0.0000

Source: E-view Output 10.0

Table 4.2 shows the t - statistics for the NGX_OilandGas, NGX_ConsumerGoods, NGX_Industrial, NGX30, NGX50 and NGX_Premium series which are 15.85277, 14.15080, 5.412893, 10.90254, 11.25137, 17.64206 and 66.77278 respectively. These numbers are much higher than the corresponding critical values at the 5 per cent level of significance, which are 2.068710, 2.068710, 2.093451, 2.072372, 2.034854 and 2.06227, and this confirms the existence of price bubbles for the above-mentioned sectors over the period under consideration. In all cases the associated p-values are exactly zero, which emphasises the fact that the hypothesis of no bubble is rejected with a high degree of confidence, at the 5% level. In order to ensure the methodological consistency and robustness, we applied the backward supremum augmented Dickey-Fuller (BSADF) dating - stamped test. In accordance with Philips et al. (2015), the GSADF statistics are considered an indication of a bubble if they

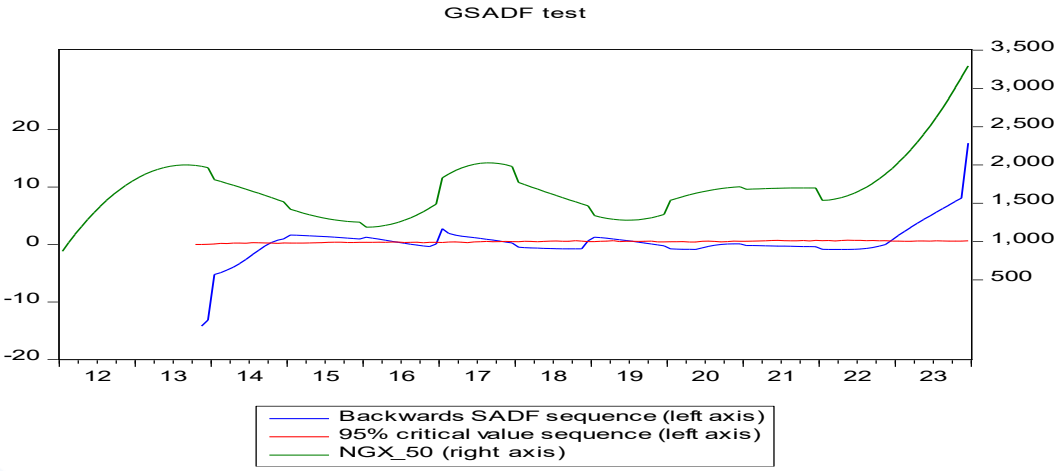
remain in the above-mentioned critical envelope for two months; a lower durational threshold is considered insufficient to indicate a bubble. Consequently, we offer graphical representations of these as illustrated below:

Therefore, graphical examples given in this research follow the following form:



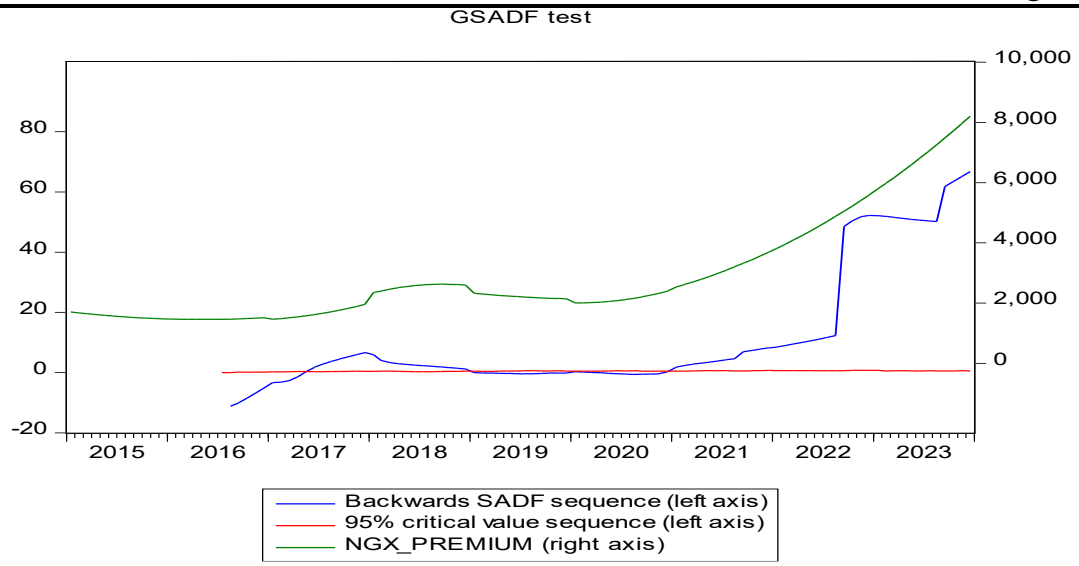
GSADF Result for Detection of Bubbles in NGX_30 Figure 4.1:

Figure 4.1 revealed the presence of multiple bubbles in the NGX_30 for the periods October 2009 to February 2011. This is attributed to the fact that the backwards SADF line lies above the 95% critical value sequence for more than two months consistently. This makes the study to uphold the result of table 4.2 for the existence of multiple bubbles in the NGX_30.



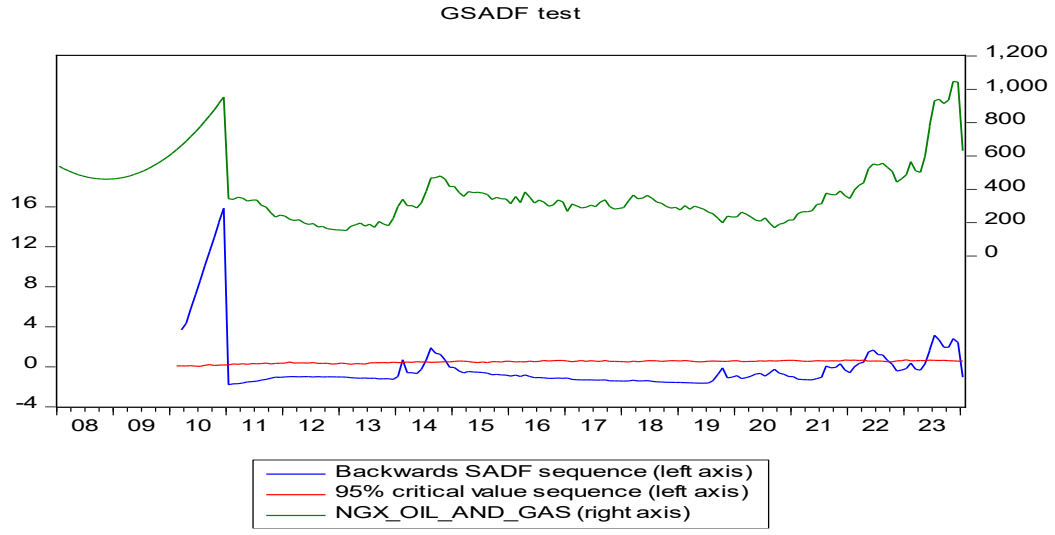
GSADF Result for Detection of Bubbles in NGX_50 Figure 4.2:

Figure 4.2 revealed the presence of multiple bubbles in the NGX_50 for the periods – December 2014 to February 2016, December 2016 to July 2017 and January 2023 to December 2023. This is attributed to the fact that the backwards SADF line lies above the 95% critical value sequence for more than two months consistently. This makes the study to uphold the result of table 4.2 for the existence of multiple bubbles in the NGX_50.



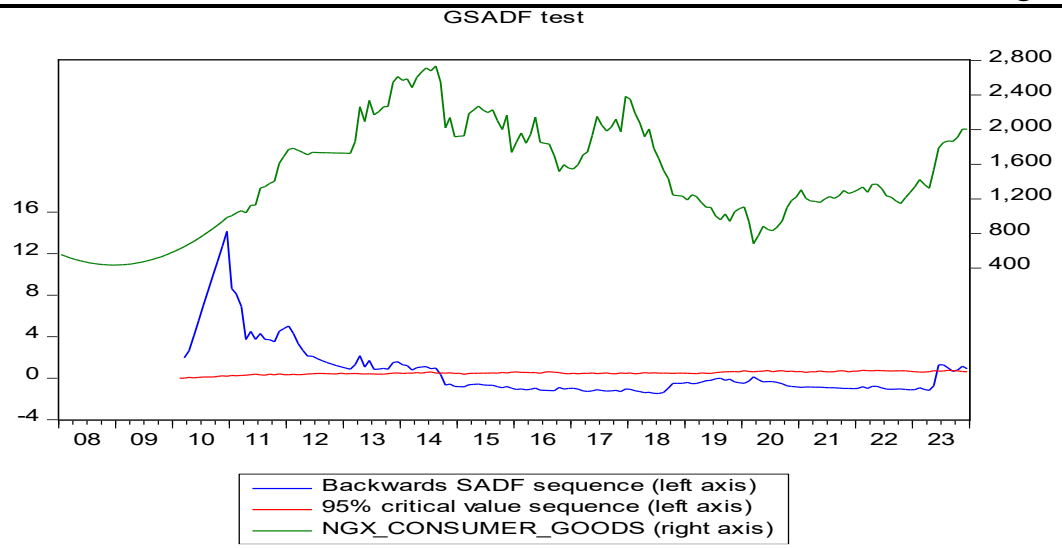
GSADF Result for Detection of Bubbles in NGX_Premium Figure 4.3:

Figure 4.3 revealed the presence of multiple bubbles in the NGX_Premium for the periods – December 2016 to March 2017 and June 2020 to December 2023. This is attributed to the fact that the backwards SADF line lies above the 95% critical value sequence for more than two months consistently. This makes the study to uphold the result of table 4.2 for the existence of multiple bubbles in the NGX_Premium.



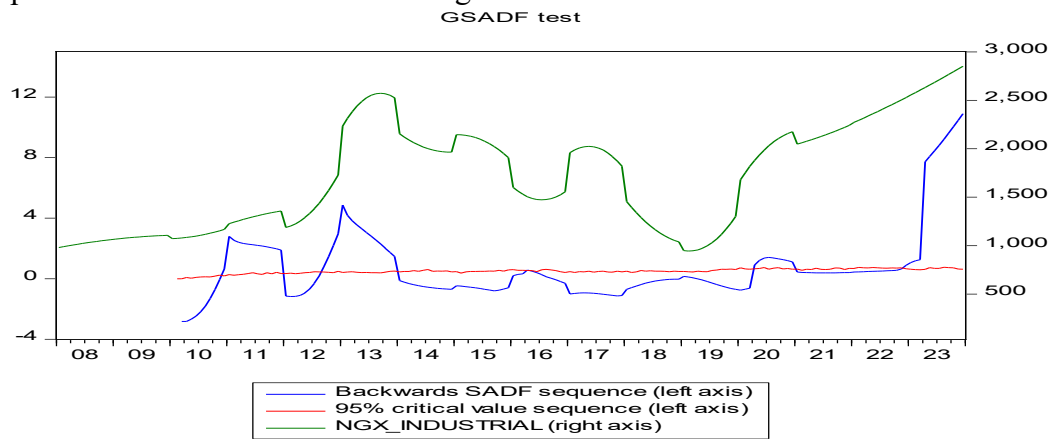
GSADF Result for Detection of Bubbles in NGX_Oil_Gas Figure 4.4:

Figure 4.4 revealed the presence of multiple bubbles in the NGX_Oil_Gas for the periods – August 2009 to July 2011, February 2014 to June 2014 and November 2022 to September 2023. This is attributed to the fact that the backwards SADF line lies above the 95% critical value sequence for more than two months consistently. This makes the study to uphold the result of table 4.2 for the existence of multiple bubbles in the NGX Oil and Gas.



GSADF Result for Detection of Bubbles in NGX_Consumer_Goods Figure 4.5:

Figure 4.5 revealed the presence of multiple bubbles in the NGX_Consumer_Goods for the periods – December 2010 and September 2014. This is attributed to the fact that the backwards SADF line lies above the 95% critical value sequence for more than two months consistently. This makes the study to uphold the result of table 4.2 for the existence of multiple bubbles in the NGX consumer goods.



GSADF Result for NGX_Industrial Figure 4.6:

Figure 4.6 revealed the presence of multiple bubbles in the NGX_Industrial for the periods – March 2010 to March 2011, February 2012 to May 2013 and June 2023 to December 2023. This is attributed to the fact that the backwards SADF line lies above the 95% critical value sequence for more than two months consistently. This makes the study to uphold the result of table 4.2 for the existence of multiple bubbles in the NGX industrial.

4.2 Discussion of Findings

4.2.1 NGX_Oil_Gas

The findings from the Table 4.2 and the Figure 4.2 support the multiple speculative bubbles within NGX Oil and Gas on the Nigerian Stock Exchange. The data indicate that NGX Oil

and Gas could not accept the high dissemination of adverse influences in the exchange and thereby exposes itself to contagion. Bubbles were established over the period August 2009 to July 2011 and this period corresponded with high volatility due to chaotic activity by the market and the increase of "noise trading." Such trading had the initial result to increase index prices which attracted more investment from domestic and international investors. The large appreciation and rapid acceleration in the index happened without the support of any fundamental elements and was the result of the behaviour of investors who, seeing some stocks as 'informed' players, imitated their transactions, as is consistent with the traditional herding theory (Kindleberger 1978; Xiong and Yu 2011). Furthermore, availability of margin loans by Nigerian banks to fund leveraged purchases of oil share and gas share prices moved in magnification. Nonetheless, the absence of a safe fundamentals-based underpinning led to a steep decline in the value of the index. This erosion coincided with the escalated Boko広島 insurgency, starting in July2009 (BBC2019; U.S. Department of State 2010), which affected the political-economic context in Nigeria (Asekome & Agbonkhese 2015; Aigbovo et al. 2017) and forced investors to withdraw large parts of their investments.

4.2.2 NGX_30

The results of the empirical evidence of multiple bubbles in the NGX_30 are shown in Table 4.2 and Figure 4.1. The NGX 30 seems to have been unable to cope with the effects of the adverse conditions engendered by the expansion of bubbles in the exchange. Bubbles are being observed in the period October 2009 to February 2011. The phenomenal increase in market capitalisation could be attributed to noisy trading and margin borrowing. Flame-Out trading strategy initially raised price levels, drawing in fresh inflow of capital from local and foreign investors. The index underwent a very rapid dramatic increase without supporting fundamental data. This outcome is due to the perception of the selected stocks as authoritative by other market participants implying imitation behaviour as previously documented (Kindleberger 1978; Xiong & Yu 2011). Role of bank provide margin financing again come into surface enabling margin purchase and inflating index price. The eventual disappearance of the bubble coincides with the firing up of the Boko_Haram insurgency (BBC 2019; U.S. Department of State 2010). The conflict changed the political-economic environment of Nigeria, affecting in large measure, the domestic and international players. As a result, investors pulled part of their investments, consistent with the conclusions relating to non-financial variables as catalysts of bubbles: political changes, noise and over-confidence (Asekome & Agbonkhese 2015; Aigbovo, Ozekhome and Isibor 2017; Olulu-Briggs and Sunday 2023). This is in contrast to Iliyasu & Saba (2019) who reported the absence of bubbles within the NGX 30.

4.2.3 NGX_50

Table 4.2 and Figure 4.2 illustrate that there are many bubbles in the NGX_50, which is indicative of the absence of resistance to propagation of negative effects across the index. The index had several bubble episodes; December 2014 to February 2016, December 2016 to July 2017, and January 2023 to December 2023. The December 2014-February 2016

bubble seems correlated with shifts in the political environment, in preparation for the 2015 general election (U.S. Department of State 2015). To begin with, noise trading drove the index upwards, leading to further capital inflows. The swift rise of prices had no real rational foundation because investors overestimated the value of some stocks based on their own intellectual and copied their investment modes, which are typical of "greater fools" behaviour (Kindleberger 1978 Xiong, Feng, and Yu, 2011). The burst of the bubble led to a sharp decline, due to political volatility and erratic trading, which caused investors to pull out holdings. Similarly, the December 2016 - July 2017 bubble seemed to repeat previous behaviour, causing only a temporary boost followed by a reduction in value due to the absence of inherent fundamentals as seen in the Central Bank of Nigeria's Monetary Policy Committee in (2017). This agrees with previous studies recording bubble occurrences in the NGX 50 (Igbinovia and Igbinovia 2019; Iliyasu et al. 2021;iliyasu et al. 2020). Nonetheless, Iliyasu & Saba (2019) debated the existence of bubbles in Nigerian Exchange Group.

4.2.4 NGX_Premium

Table 4.2 and Figure 4.3 show that NGX_Premium experienced several bubble episodes, between December, 2016, and March, 2017, in particular. In this period the market capitalisation of the index increased; however this increase in market capitalisation had no apparent underlying rationale. Accordingly, it may be that NGXPremium did not demonstrate resilience in the face of speculative bubble dynamics by definition of the Central Bank of Nigeria. The behaviour that is actually observed is likely to be investors buying equities on the assumption of other investors buying in rather than on the basis of value assessment and hence a post-bubble decline from lack of understanding of the true nature of markets. This outcome is in line with characterization of bubble by the MPC (Central Bank of Nigeria 2017), and corroborates evidence by Igbinovia & Igbinovia (2019) and Iliyasu et al. (2021, 2020) on the presence of bubbles in the Nigerian Exchange Group. On contrary, no such episodes were reported by Iliyasu & Saba (2019).

4.2.5 NGX_ConsumerGoods

Table 4.2 and Figure4.3 show several bubbles inside the NGX_ConsumerGoods business sector. The industry did not hold the negative force transmitted by Nigerian Exchange Group and generated and spread speculative bubbles. Bubbles recorded between December 2010 and September 2014. The price increase was attributed to speculative trading from investors on the exchange which could be compounded by a cognitive distortion from those who chose companies without a proper understanding of the market conditions. This problem is caused by a belief that selected stocks are authoritative, so other investors would imitate them if they carry out similar trades (Kindleberger 1978; Xiong and Yu 2011). The end of this bubble is coinciding with the growing Boko Haram insurgency, starting from July 2009 (BBC 2019; U.S. Department of State 2010). The effects of the change in the political and economic environment in Nigeria had a negative impact both locally and overseas. Investors as a result withdrew significant amount of capital which further attests to the conclusions of Igbinovia & Igbinovia (2019), Iliyasu et al. (2020, 2021). However, this finding was disagreed by

Iliyasu & Saba (2019) who reported no presence of bubbles within the Nigerian Exchange Group.

4.2.6 NGX_Industrial

Table 4.2 and Figure 4.5 prove the existence of multiple bubbles in NGX_Industrial, proving it is unable to withhold the adverse consequences proliferated and amplified across the Nigerian Exchange Group. Bubbles appeared in March of 2010 to March of 2011 and February of 2012 to May of 2013. This tendency may be due to the fact that investors make decisions on equities by a lack of complete understanding of basic market flows, see them as authorities and, then, copy their strategies, an outcome again shown by Kindleberger's and Xiong and Yu's frameworks. An unwarranted crash followed the bubble because of a lack of sound underpinnings. Insurgency's escalation from July 2009 contributed to significant impact on both domestic and international players resulting into changed political & economic conditions as well as investors disinvesting parts of capital. This storey is similar to the analysis of Igbinovia & Igbinovia (2019) and the observations of Iliyasu et al. (2021, 2020) on the existence of bubbles at the Nigerian Exchange Group, but Iliyasu & Saba (2019) however defeat this assertion.

4.3 Limitations of the Study

Available data that were published for NGX 50 and NGX Premium by the Central Bank of Nigeria and the Nigerian Exchange Group start with 2012 and 2015 respectively. Extending the data horizon for the experience, would probably have more robust estimates. Consequently, while the results of the present study have statistical reliability, their precision will be improved using accumulated data.

5.0 Conclusions and Recommendations

This investigation has evaluated the incurrence of sectoral bubbles in the Nigerian Exchange Group by using monthly observations during the period 2007-01-2023-12. Six indices, namely NGX 30, NGX 50, NGX Industrial, NGX Consumer Goods, NGX Oil and Gas and NGX Premium, were scrutinised using descriptive statistics and GSADF date stamping methodology using 95 percent level of confidence. The study conclusion is that there are several bubbles affecting all the sectors of the Nigerian Exchange Group studied.

In view of the results of these findings, the recommendations articulated below are made:

i. The Nigerian Exchange Group needs to boost investor education efforts more. Heightened awareness of bubble risks is able to overcome irrational enthusiasm and provides encouragement to make better informed investment decisions.
ii. The Nigerian Exchange Group should promote portfolio diversification in order to spread risk across asset classes in order to minimise potential losses in case of a bubble.
iii. The Nigerian Exchange Group should make use of advanced analytics and data-driven tools to support early detection of the bubbles and timely remedial action by leveraging big-data and machine-learning tools to recognise anomalous market pattern indicative of impending bubbles.

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