Effect of Capital Market Reforms on the Efficiency of Nigerian Stock Market

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Abstract
Financial reforms are aimed at transforming the financial sector through various policy initiatives to improve the efficiency of the financial sector. The unwavering problems of the Nigerian financial sector have raised arguments about the way in which appropriate reforms could be enforced to stimulate the growth of the sector. This study therefore, examined the effect of capital market reforms on the efficiency of Nigerian stock market. Secondary data were used for this study. The relevant data were sourced from Securities and Exchange Commission Statistics and Central Bank of Nigeria between 1982 and 2021. The results of the DEA showed that of the period of forty (40) years examined, the Nigerian stock market was efficient for sixteen (16) years considering the capital market reforms in existence with efficiency scores varying between 0.969 and 1. It was recommended that the regulatory authorities of the capital market should continue to make concerted efforts towards cushioning the effects of the global financial meltdown on the Nigerian Exchange Group which has significantly affected its performance. This will help to restore investor's confidence and revival in the market.

Key words: *Reforms, Capital Market, DEA, Nigerian Exchange Group*

Introduction

Reforms are focused on enhancing the performance and efficacy of organizations or industries (Soludo 2004). Financial reforms are primarily aimed at reforming the institutions and markets of the financial sector by various policy initiatives (Anyanwu 2010). In other words, financial reforms should enhance the role of stock market intermediation to achieve productivity by improving the average Nigerian's standard of living. Adelegun and Oriavwote (2014) noted that the transition from an inefficient state-dominated economy with significant rigidities to a more dynamic market-oriented economy with more diversified development leading to economic growth remains the government's primary policy thrust.

Over the years, the capital market has also undergone a lot of changes and is still in place, especially with regard to the operators' capital requirements, the institutions' operational and ethical standards and the modalities of the market process. The system's changes have had a positive impact on the development of the financial system and the economy in general. In these markets and within the financial system as a whole, what happens on a regular basis has a strong impact on the economy. The financial market is forever reshaped by broad changes as new institutions, new approaches, new challenges and new services are constantly emerging. Reforms also aim to act proactively in order to reinforce the structure, to avoid economic crises, to improve the structures of the market and to set ethical standards (Omankhanlen, 2012).

The capital market, consisting of the equity (stock) market and the debt (bond) market, is a market for dealing in longer-term loanable funds. In addition to playing a central role in creating and promoting capital development, the capital market also provides the atmosphere for the stock exchange to carry out its functions. The Nigerian SEC functions as the market's apex regulatory agency, while the Nigerian Exchange Group (NGX) offers the market's issuing facilities and transaction avenues. Stockbrokers who gather on the exchange via intermediaries named do these. Merchant banks, development banks, and institutional saving units such as the National Provident Fund (NPF), Pension Funds, Unit Trusts, Investment Corporations, Security Registrars of Insurance Companies, and Issuing House are the major dealers on the market. The instruments of the capital market include stocks/shares, debentures, bonds, and mortgages.

Capital markets are perhaps the markets which are most commonly followed. Both the stock and bond markets are closely tracked and their daily movements are evaluated as indicators for the financial markets' general economic situation. Therefore, the stock market only contributes to economic growth when ample savings and financing are available (Usman, 2011). As a result, capital market institutions are included; stock exchanges, commercial banks and other forms of businesses, including non-bank institutions such as insurance companies and mortgage banks, are closely scrutinized. Capital market institutions have access to capital raising for long-term reasons, such as for the purpose of merger or acquisition, for the purpose of extending the line of business or joining a new business, or for other capital projects. In one or more capital markets, companies that collect funds for these long-term purposes arrive.

Statement of the problem

The crash of world oil prices and the sharp fall in oil production, the latter resulting from the lowering of the OPEC quota in Nigeria in the early 1980s, brought the precarious existence of the economic and financial positions of the country to the fore. During the 1970s, increasing and ill-directed government spending, neglect of the agricultural sector, and inward-looking industrial policies left Nigeria exposed in the following decade to profound changes in the external climate. As a result, the drastic decline in oil export revenues has led to a sharp deterioration in the public finances and balance of payments of the country. This has contributed to recession and economic deterioration, as demonstrated by the fiscal crisis, the scarcity of foreign exchange, the balance of payments and the debt crisis, high unemployment rates, negative economic growth, to name a few (National Centre for Economic Management and Administration-NCEMA 2013).

The need to adapt to the structural imbalances and external shocks was also evident. But then, the form of change that was required was an important problem that needed to be discussed. Three policy options have been left to the government: (i) preserve the status quo, i.e. continue austerity policies without structural adjustment reforms; (ii) approve the IMF Structural Adjustment Facility, including its conditionalities; and (iii) reject the proposal for an IMF loan, but follow an updated version of the conventional structural adjustment program planned and implemented by the IMF (NCEMA 2013).

Many developing countries experienced a decline in their macroeconomic output in the early 1980s. In the past, the economic policies followed by these countries and the inhospitable external economic climate were largely responsible for different macroeconomic challenges. Eventually, these countries turned to the International Monetary Fund (IMF) to assist them in drawing up a reform package that would include measures to restore macroeconomic stability and sustainable economic development. Finally, many developing countries have agreed to adopt the IMF's Structural Adjustment Programmes (SAPs). These services are then standard for qualifying for a new loan from the World Bank and the IMF (Waheed 2009).

A series of liberalization and deregulation measures were prescribed by the SAPs, covering most economic activities, including financial sector reform. A policy of export-led development, privatization and liberalization was to follow the common guiding principles of the SAPs and emphasize the efficiency of the free market. SAPs were also required to devalue the currency against the dollar, to lift restrictions on imports and exports, to balance the budget (by raising taxes and decreasing expenditure), and to remove price controls and government subsidies.

The key problem identified, however, is the issue of the potential pre- and post-impact of the recent reforms in the financial sector. In doing so, parallels are made with past reforms and those currently carried out to actually assess the true state of the financial sector in Nigeria and how much it has helped the nation's economic growth with regard to the stock market. Lack of adequate attention to the needs of the real sector of the economy, insufficient financial development policy structures, poor regulatory regulation in a highly liberalized financial climate that enables banks to become excessively optimistic, audacious, less transparent and less accountable in managing their diverse portfolios of services are among the key problems (Omankhanlen, 2012).

The focus of reforms is to improve the financial sector's efficacy and efficiency (Soludo 2004). More importantly, the Nigerian economy has been plagued by a slew of socio-economic and political issues that are antagonistic to progress. Capital markets around the world act as veritable conduits for mobilizing both domestic and international savings for development. However, notwithstanding the progress made by the Nigerian capital market in the area of capital formation over the years, individuals, corporations, and the government have yet to fully exploit market prospects due to a shortage of recovery funds.

Hypothesis

H_1: Capital market reforms have an impact on stock market efficiency in Nigeria.

Ho: Capital market reforms do not have an impact on stock market efficiency in Nigeria.

This study is therefore divided into five sections with introduction discussed above. Section two dwells on the literature review while section three explains the methodology. Section four analyses and discusses the findings of the study and section five ends with conclusion and recommendation.

Literature Review

The financial market in Nigeria is composed of two main markets: the money market and the stock market. Short-term funds and assets, including treasury bills, one-year treasury certificates, central bank notes, negotiable depository receipts, business documents, commercial and merchant bank savings and investment notes, and other funds with a period of less than one year, are the money market. The Stock Market, on the other hand, refers to longer-term funds and shares whose tenure lasts beyond a year. Long-term loans, mortgage bonds, preferred stocks, ordinary shares, federal government bonds, corporate loans and debentures are included (Ubesie *et al.* 2020).

According to Osaze (2007), the stock market is a dynamic institution and process in which intermediate funds and long-term funds are pooled and made available to industry, government and individuals. Over the years, the Nigerian capital market has experienced remarkable growth. This is largely attributed to changes in the economy triggered by the Federal Government's successive reform programs.

Despite the laudable success and benefits of the Nigerian capital market, there are still some drawbacks, including: the Securities and Exchange Commission's (SEC) Bureaucratic Mechanism for the processing of applications submitted to it; the private sector, to which most operators belong, is not used to the public sector's leap and tumble system; but operates by leaps and bounds; The fee paid by the exchange is unreasonably high; the imposition of taxes by all three levels of government to which the companies are subject; Nigerians' purchasing and keeping attitude, vast ignorance of the existence and benefits of the capital market by a large population of the Nigerian public; few investment outlets on the market, lack of economic policies and reforms friendly to the capital market. Among the shortcomings that weaken the capital market as the engine and pivot for economic growth and development in Nigeria are political instability and political instability (SEC, 2006; CBN, 2007; Donwa and Odia, 2009).

The Nigerian capital market has continued to keep pace with various economic policies that together have led to its development and growth. The process of our economic growth that has come as a result of numerous federal government reforms continues to be reflected. In turn, this has challenged the capital market regulator (SEC) to evolve current/modern regulatory processes, rules and regulations and growth strategies in line with the challenges and outcomes of government reforms (SEC 2006).

Like other financial sector reforms, capital market reforms are intended to reposition the market in order to make a more efficient contribution to the economy. Reforms include areas such as operator recapitalisation, the analysis of business processes and regulations, the introduction of new products and the development of market infrastructure (SEC 2006). Through a combination of its developmental and regulatory position in the capital market, the Securities and Exchange Commission has taken significant measures in the areas of public knowledge, creation of new products, rule-making, market regulation and compliance in support of the changes it has undertaken as the market leader.

Capital market reforms are theoretically split into two: regulatory reforms (reforms driven by the government) and administrative reforms (market led reforms). While the government driven reforms included the enactment of laws that promote the free flow of trade between Nigerians and foreigners in and out of the country, the market-led reforms included reforms carried out by key market players in an attempt to continually cope with the increasing competition and risk inherent in Nigeria's stock exchange and economy in general.

In order to make the capital market more competitive and successful, these reforms were carried out in order to draw more investors to the capital market; to create interest among potential investors; and to make the Nigerian capital market level comparable to that of other rapidly developing economies, such as India, Malaysia and Singapore. Some of the reforms implemented in Nigeria by the apex capital market regulatory body (SEC), according to Idolor and Eboigbe (2015), include:

i. A distinct window for the transfer and registration of shares, implemented in 1996 for foreign investment in the local stock market, aimed at reducing the waiting period for these classes of investors to obtain certification.

ii. The reconstitution of the Securities and Exchange Commission laws to make it more investment friendly

iii. Tax strategies aimed at lowering withholding taxes on dividends and reducing the tax burden on debt and equity proceeds and yields, while much also needs to be done in relation to the latter.

iv. The implementation of regulatory initiatives expressly aimed at reducing the complexity of listing, disclosure and insider trading controls.

v. In its attempt to make the industry globally competitive and investor-friendly by allowing a 40 percent downward review of fees, the securities and exchange commission has also recently taken measures to reduce the cost of doing business in the market. Moreover, it has now been made mandatory to underwrite all public offers. All deals must be 80% underwritten from now on. This is aimed at reducing the occurrence of under-subscription and ensuring that houses and stockbrokers are more interested with the problems they bring to the market (Onwujei, 2011; Egwuatu, 2007).

vi. The minimum paid-up capital has been updated upwards in order to allow operators contribute more to the development of the real sector (and, indeed, the economy in general). In 2005, the SEC implemented a new minimum capital requirement for certain types of capital market operators (Al-Faki, 2008). Many operators who were previously not required by law to have a minimum paid-up capital are now required by law to operate under the new minimum paid-up capital requirement laid down by the Securities and Exchange Commission as part of the ongoing capital market reforms in the country.

Market operators' recapitalisation is intended to improve them financially for international competition and, more importantly, to balance their resources with their visibility. It is also to help root out quacks from the capital market as undercapitalized operators that have little or no investment to lose are often correlated with the greatest cases of irregularities and fraud. It should be noted that this step would go a long way in preparing the operators of the capital market to play new roles in the economy, including active involvement in the real sector.

vii. The introduction of market makers whose minimum capital base is N2 billion is an ongoing development in the Nigerian capital market. The Commission is currently working with the Nigerian Exchange Group (NGX) to incorporate, in addition to the market makers already operating in the bond sector, primary dealer market makers for the equity sector. This is with the intention of adding liquidity to the debt market. The Securities and Exchange Commission is currently actively involved in the recruitment of Primary Dealers and Market Makers (PDM's) in cooperation with the Debt Management Office (DMO).

viii. The Abuja Stock Exchange was converted into a securities and commodity exchange on August 8, 2005 as part of the on-going reforms of the Nigerian capital market. As compared to securities and bonds, a commodity exchange facility deals in commodities. The securities and exchange of Abuja is currently trading manually, namely on a few selected grains; maize, cowpeas, sorghum, sesame seeds and millets. The exchange promises to be of immense benefit to the agro-commodity processors and merchants of farmers as it serves as a real forum for them to mitigate the risks of interest in agricultural production and marketing, while promoting commercial agriculture and agricultural sector development (Egwuatu 2007).

ix. In order to facilitate the introduction of new products into the Nigerian capital market, the Securities and Exchange Commission is also cooperating with important stakeholders. This is part of its attempt to expand the market (both in scope and breadth) and to offer a broader variety of goods to investors and to keep pace with worldwide innovations. The Commission is now offering the required regulatory structure for the operation of facilities such as mortgage-backed securities, asset-backed securities, and real estate investment trusts (REIT'S), all of which are international and actually non-existent on the stock exchange.

To this end, the Commission set up an in-house committee in 2004 to supplement efforts by the Federal Government to provide its people with safe and affordable housing. As a follow-up to this, the Commission held a national workshop on mortgaged-backed securities in partnership with the Mortgage Bank of Nigeria, defining areas requiring changes to promote the introduction of mortgage-backed securities into the Nigerian market. The strengthened enabling climate led to the issuance in 2006 by the Federal Mortgage Bank of Nigeria of N400 billion residential mortgage bonds (Al-Faki 2006). It is anticipated that interventions of this nature would have a tremendous multiplier effect on the real sector, especially the construction sub-sector.

x. The SEC industry committee has also been working tirelessly to develop the country's over-the-counter (OTC) market. The committee is currently working on a proposal to allow Capital Trade Points (CTP's) to be traded, which would have a minimum capital requirement. Capital Exchange Points (CTP) are ways for small businesses to increase their operations with long-term financing. Consequently, the Commission has embarked on sensitizing the future promoters of CTPs. When operational in Nigeria, the advantages of CTP would include:

a. Provision of quotation facilities and ready marketability of small companies' shares and securities, thus growing liquidity in the financial system.

b. Offer local and international investors the opportunity to invest in local businesses and take advantage of any profit they make.

c. Give local markets to businesses for leasing and lending purposes.

d. Provide a stable and mutually acceptable climate for indigenous companies to participate, exchange and collaborate in a deficit-financial position.

xi. The SEC is also actively involved in capacity building and the growth of human power in the capital market of Nigeria. The SEC training school was upgraded and transformed to become the Nigerian capital market institute during the period under review (NCMI). Since its establishment in 2001, the college, which has since been registered with the Corporate Affairs Commission, has trained specialist manpower for the industry, the NCMI has conducted about 44 workshops with more than 1,500 participants. Participants include participating operators, journalists, and academic institutions. Therefore, in its efforts to develop capacity, the Institute hopes to continue updating the awareness of capital market operators and other stakeholders on topical issues affecting the market.

xii. Over the years, the Nigerian capital market has undergone some technical changes as well. These are the implementation of the Automated Trading System (ATS), the Central Securities Clearing System (CSCS), the portal for electronic business and trade warnings. The Nigerian stock exchange faced a major challenge in 1977, including, on the one hand, the ever rising volume of transactions and, on the other, maintaining transparency in transactions. An growing concern has been the need for an open market where price determination is efficient and transparent. By then, the call-over system had been overstretched. A sudden transformation of the scheme was required (Al-Faki 2008).

The NGX commissioned the CSCS on 14 April 1999 in order to achieve the benefits of the ATS. As the clearing house of the Nigerian stock exchange, the CSCS started full operation with functions that included: clearing and settlement of shares, central depository and custodian facilities, digital data storage and retrieval, and settlement of international financial transactions. Other technical changes included: the implementation of trade alerts in September 2004 - 'Trade alerts' are a way of defending securities and the economy against increasing risks from fraud, The introduction on July 1, 2005 of e-bonuses, e-IPOs and e-POs into the Nigerian capital market and the admission of international stocks to be listed on the Nigerian stock exchange were other reforms that allowed great use of some of the latest available information and communication technologies (ICTs).

The ongoing reforms in the Nigerian capital market have had a major positive effect on the markets (Idolor and Eboigbee 2015). These include:

1. As the Security and Exchange Commission now maintains a zero-tolerance policy for capital market malfeasance, health now tends to prevail in the capital market.

2. It may have been put on the road to deepening the economy by restoring health in the underdeveloped market, maintaining progress in the raising of long-term funds that are necessary conditions for economic growth and development.

3. The stock market was characterized by weak infrastructure, high transaction costs, fraudulent activities, low capitalization, long delays in settlements and the 'buy and hold' mentality of investors prior to the Nigerian banking industry reform and consolidation programme in 2005.

4. Indeed, the 2005 reform and restructuring program of the banking industry seems to have deepened the capital market and the economy in general, as the majority of the Deposit Money Banks had access to the capital-raising market.

5. During the reform era, the dedication of Nigeria to the reforms also won it a 'BB' sovereign rating from FITCH, an international rating agency.

The efficiency of the stock exchange and economic development of Nigeria for the period between 1979 and 2008 was critically analyzed by Olowe, Matthew and Fasina (2011) as a reference point for developing economies at the core of this work. The work was based on multiple regression methods of econometric analysis. A negative relationship between the turnover ratio and the Gross Domestic Product was revealed by the major results.

The impact of capital market reforms on Nigerian economic growth between 1981 and 2010 was examined by Oke and Adeusi (2012). To analyze the secondary data from the Central Bank of Nigeria statistical bulletin, the Nigeria Stock Exchange fact book and the Nigeria Security and Exchange Commission Reports, the Ordinary Least Square regression method and the Johansen co-integration analysis were used. The results show that economic growth has been positively affected by capital reforms.

Usman and Abdulmumini (2013) studied the impact of the stock exchange market on Nigeria's economic growth from 1981 to 2010. The research used the Johansen Co-integration test approach and the data analysis Granger Causality test. The outcome showed that there is a positive long-term relationship in Nigeria between market capitalization, value trading, and economic growth.

Methodology

The type of data used in this research work is the secondary data. The relevant data for the study was obtained from publications Central Bank of Nigeria (CBN) statistical bulletin and Security and Exchange Commission (SEC) publications between 1982 and 2021.

The formulation of this model is based on the empirical review of Oke and Adeusi (2012) and Akpunonu *et al* (2019) who proxied capital market reforms with market capitalization, all share index, inflation rate, number of listed (quoted) companies, value of transactions and number of deals. Hence, these served as the input units with the modification of incorporating new issues. While the output units are number of listed securities and number of stock broking firms

Thus, this model addressed objective four which analyzed the impact of capital market reforms on the efficiency of Nigerian stock market

The equation for data envelopment analysis is represented below. This was used to determine the efficiency of the stock market with respect to capital market reforms.

$$E = \frac{\sum_{i=0}^{n} t_i u_i}{\sum_{i=0}^{n} r_i s_i v_i x_i y_i w_i z_i} \qquad \text{(Eqtn 3.12)}$$

where:

r_i = Number of New Issues

s_i = Number of Deals

x_i = Market Capitalization

v_i = All Share Index

y_i = Inflation Rate

w_i = Number of Listed Companies

z_i = Value of Transactions

u_i = number of listed securities

t_i = the number of stock broking firms

n = number of years

E = efficiency of the stock market

Results and Discussions

A unit root test was conducted to ascertain the stationarity of the data before estimation using Augmented Dickey Fuller (ADF). The results in table 4.1 below revealed the unit root properties/stationarity of the variables employed in this research work.

The test results showed that only Inflation Rate (INFR) was stationary at level (integration order of level I(0)). Number of Issues (NI) were stationary after second differencing I(2). While the rest of the variables: Market Capitalization (MC), All Share Index (ASI), Number of Deals (ND), Number of Listed Companies (NLC), Number of Listed Securities (NLS), Number of Stock Broking Firms (NSBF), and Value of Transactions (VT) all have unit root properties but became stationary after first differencing that is I(1).

Table 4.1: Results of Unit Root Test

Variables	ADF T- Statistics		Remarks
	Level	1st Difference	
Market Capitalization (MC)	-1.0027	-7.7578***	I(1)
All Share Index (ASI)	-2.2313	-6.0981***	I(1)
Number of Deals (ND)	-3.0529	-7.7958***	I(1)
Number of Issues (NI)	-2.0066	-3.0653	I(2)
Number of Listed Companies (NLC)	-2.5964	-6.0164***	I(1)
Number of Listed Securities (NLS)	-2.3601	-6.2889***	I(1)
Inflation Rate (INFR)	-3.5261*	-4.8539***	I(0)
Number of Stock Broking Firms (NSBF)	-1.9269	-5.7310***	I(1)
Value of Transactions (VT)	-3.6883	-5.8844***	I(1)

Source: Author's findings, 2022

NB: *** Indicates significance at 1%

** Indicates significance at 5%

*Indicates significance at 10%

Granger Causality Test Results

Granger causality is a statistical concept of causality that is based on prediction. According to Granger causality, if a variable X "Granger-causes" a variable Y, then past values of X should contain information that helps predict Y above and beyond the information contained in past values of Y alone. The rule of thumb is to reject null hypothesis if probability value (p-value) is less than or equal to 1%, 5% or 10% and to accept null hypothesis if probability value (p-value) is greater than 1%, 5% or 10%.

The results of the granger causality revealed that some of the indicators of capital market reforms are unidirectional: number of listed companies (NLC) and inflation rate (INFR); number of listed securities (NLS) and inflation rate (INFR); number of listed companies (NLC) and market capitalization (MC); value of transactions (VT) and market capitalization (MC); and value of transactions (VT) and number of listed companies (NLC). The following indicators are bidirectional: number of stock broking firms (NSBF) and market capitalization (MC) as well as number of stock broking firms (NSBF) and number of deals (ND). Others that were not reported do not have causal relationship.

Table 4.2: Granger Causality Test Results

Null Hypothesis:	Obs.	F-Statistic	Probability
NLC does not Granger Cause INFR	37	0.37146	0.6927
INFR does not Granger Cause NLC		6.72825	0.0036
NLS does not Granger Cause INFR	37	0.33681	0.7165
INFR does not Granger Cause NLS		3.18802	0.0546
NLC does not Granger Cause MC	39	0.10104	0.9042
MC does not Granger Cause NLC		3.20402	0.0531
NSBF does not Granger Cause MC	39	2.51189	0.0961
MC does not Granger Cause NSBF		5.40921	0.0091
VT does not Granger Cause MC	39	2.03395	0.1464
MC does not Granger Cause VT		7.41740	0.0021
NSBF does not Granger Cause ND	37	6.38836	0.0046
ND does not Granger Cause NSBF		3.91051	0.0302
VT does not Granger Cause NLC	39	2.60780	0.0884
NLC does not Granger Cause VT		0.99130	0.3816

Source: Author's Research, 2022

The table below shows the efficiency of all the listed companies on the Nigerian Stock Market with reference to capital market reforms. The result however, indicate that of the period of the years examined in this study, the Nigerian stock market was efficient for sixteen (16) years out of forty (40) years as indicated in the table below. The implication is that the Nigerian stock market was successful in converting input to output and also utilized a better scale of adoption of capital market reforms within the period under study.

Table 4.3: Efficiency scores of listed companies on the Nigerian Stock Market

Decision Making Units (DMUs)	Efficiency score
1982	1
1983	1

1984	1
1985	1
1986	1
1987	1
1988	1
1989	1
1990	1
1991	1
1992	1
1993	0.99269
1994	1
1995	0.99967
1996	0.99484
1997	1
1998	0.99449
1999	0.99286
2000	1
2001	0.99937
2002	0.97973
2003	1
2004	0.97543
2005	0.96876
2006	0.97975
2007	0.99268
2008	0.99459
2009	0.98781

2010	0.97065
2011	0.97016
2012	0.98388
2013	0.98513
2014	0.98924
2015	0.98912
2016	0.97898
2017	0.97849
2018	0.9897
2019	0.99781
2020	0.99427
2021	1

Source: Author's findings, 2022

Input Slacks for Nigerian stock market

The slacks input are the redundant inputs that can be done away with in DEA efficiency analysis without sacrificing efficiency. The slacks for the various inputs and outputs combinations employed in this research are shown in the table below. The input slacks for each of the DMUs represents the amount by which specific inputs for a particular year must be reduced while the output slacks represent the increase in the level of output for a particular year to attain efficiency. It can be observed from the table below that the sixteen (16) efficient DMUs (1982; 1983; 1984; 1985; 1986; 1987; 1988; 1989; 1990; 1991; 1992; 1994; 1997; 2000; 2003 and 2021) have zero slacks inputs and outputs and where slacks exist for them, they were very negligible. Hence, the remaining DMUs have separate slacks values for their inputs and outputs.

Table 4.4: Input Slacks Distribution of Nigerian stock market

DMU	slack_input.INFR	slack_input.ND	slack_input.VT	slack_input.MC	slack_input.ASI	slack_input.NI	slack_input.NLC	slack_output.NLS	slack_output.NSBF
1982	0	0.018	0.331	0	0.18	0	0.074	0.055	0
1983	7E-11	0	3E-11	0	0	1E-10	-0	0	0
1984	7E-09	0	5E-09	2E-09	0	2E-08	0	0	0
1985	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0
1987	3E-10	4E-11	2E-10	-0	0	0	2E-11	0	0
1988	2E-08	0	7E-09	9E-10	0	3E-09	0	0	0
1989	0	0	0	0	0	0	0	0	0
1990	7E-10	-7E-12	0	2E-11	0	0	0	1E-11	0
1991	0	0	0	0	0	0	0	0	0
1992	0	2E-11	3E-11	5E-11	0	0	0	0	0
1993	1.294	0.011	0.327	0	0.22	0	0	0.013	0
1994	0	2E-11	3E-11	2E-11	0	1E-11	0	0	0
1995	0.236	0	0.153	0.258	0.42	2.438	0	0	0
1996	0	0	0.313	0.834	0.89	0	0	0	0.01
1997	0	0	6E-08	5E-08	0	6E-08	0	0	0
1998	0	0.339	1.807	1.316	1.47	0	0	0	0.2
1999	0.378	0.442	2.258	1.389	1.36	0	0	0	0
2000	0	0	0	0	0	0	0	0	0
2001	2.236	1.146	2.233	1.399	1.03	0	0	0	0
2002	0	1.589	2.487	1.097	1.33	0	0	0	0.04
2003	0	1E-09	2E-09	1E-09	0	0	0	0	0
2004	0	1.384	1.958	0.514	1.21	0	0	0	0
2005	0	1.468	1.71	0.198	1.34	0	0	0	0.09
2006	0	0.513	0.629	0	0.4	0.69	0	0	0
2007	0	0.847	1.153	0.719	0.56	1.343	0	0	0

2008	0	1.425	1.663	1.226	1	1.933	0	0	0
2009	0	2.309	3.714	1.821	1.88	1.748	0	0	0
2010	0	0.885	1.449	1.084	0.26	1.837	0	0	0
2011	0	0.997	1.667	1.507	0.34	2.268	0	0	0
2012	0	2.881	6.543	4.963	2.9	3.692	0	0.016	0
2013	0	0.771	2.097	2.272	0.53	1.773	0	0	0
2014	0	1.988	3.589	3.048	1.12	3.006	0	0	0
2015	0	1.728	4.625	3.937	2.03	3.372	0	0	0
2016	0	0.473	1.417	1.292	0.57	1.071	0	0	0
2017	0.562	0.973	2.002	1.558	1.11	0.723	0	0	0
2018	0.495	0.881	2.065	1.352	1.01	0.735	0	0	0
2019	0.253	0.888	1.731	1.082	1.03	0.36	0	0	0
2020	0.241	0.257	0.372	0.094	0.36	0	0	0	0
2021	0	2E-09	6E-09	5E-09	0	4E-09	0	0	0

Source: Author's findings, 2022

Return to scale of Capital Market Reforms

The return to scale analysis results of the capital market reforms revealed that the efficiency of the stock market was quite unstable. There were periods of constant return to scale which were a total of sixteen (16) periods and increasing return to scale was a total of thirteen (13) periods. In the remaining eleven (11) periods, the stock market was operating at the decreasing return to scale.

Table 4.5: Return to Scale Analysis of Capital Market Reforms

DMU	lambsum	Return to scale
1982	1	Constant
1983	1	Constant
1984	1	Constant
1985	1	Constant
1986	1	Constant
1987	1	Constant

1988	1	Constant
1989	1	Constant
1990	1	Constant
1991	1	Constant
1992	1	Constant
1993	1.0029	Decreasing
1994	1	Constant
1995	1.003	Decreasing
1996	1.0013	Decreasing
1997	1	Constant
1998	0.9945	Increasing
1999	0.9929	Increasing
2000	1	Constant
2001	1.0018	Decreasing
2002	0.9884	Increasing
2003	1	Constant
2004	0.9886	Increasing
2005	0.9905	Increasing
2006	1.0147	Decreasing
2007	1.0132	Decreasing
2008	1.0238	Decreasing
2009	1.0243	Decreasing
2010	1.0029	Decreasing
2011	1.0031	Decreasing
2012	1.0073	Decreasing
2013	0.9949	Increasing

2014	0.996	Increasing
2015	0.9986	Increasing
2016	0.9834	Increasing
2017	0.9721	Increasing
2018	0.9789	Increasing
2019	0.9842	Increasing
2020	0.9947	Increasing
2021	1	Constant

Source: Author's findings, 2022

Summary of Findings and Recommendations

The study examined the effect of capital market reforms on Nigerian stock market using time series data for the period of 1982 to 2021. The study used Data Envelopment Analysis (DEA) to examine the efficiency of stock market. The result indicated that of the period of the years examined in this study, the Nigerian stock market was efficient for sixteen (16) years out of forty (40) years. The implication is that the Nigerian stock market was successful in converting input to output and also utilized a better scale of adoption of capital market reforms between 1982 and 2021. It was recommended that the regulatory authorities of the capital market should continue to make concerted efforts towards cushioning the effects of the global financial meltdown on the Nigerian Exchange Group which has significantly affected its performance. This will help to restore investor's confidence and revival in the market.

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