IMPACT OF CAPITAL MARKET FINANCING ON NIGERIA'S INDUSTRIAL PERFORMANCE:
An Empirical Analysis

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ABSTRACT

The capital market plays a vital role in providing long-term funding for businesses to expand. If this role is efficiently performed with the aim of industrialization, the industrial sector is expected to obtain the required funds from the market for expansion. This fact has been established in most developed economies. However, the low level of industrialization in Nigeria raises questions on whether the capital market has met the expectation of providing funds to drive industrial sector growth. Employing a firm-level perspective, this study examined the relationship between capital market financing and the extent of industrialization of firms listed on the Nigerian Stock Exchange. Specific attempt was made to see if capital market financing (debt and equity) contributes positively to the growth of the industrial sector relative to other sectors in the Nigerian capital market.

The study employed data of all publicly-listed firms on the Nigerian Stock Exchange from 1980 to 2016, with these firms further grouped into their relevant industries. The transcendental logarithmic (translog) production function that incorporates debt and equities alongside the traditional labour and capital inputs was used to examine the impact of capital market financing on the progress of industrialization in Nigeria. Results from the analysis support the positive contribution of the capital market to the progress of

industrialization, and the study recommends further redirecting of capital market funding towards improved industrial sector growth.

JEL classification: E 62, O16

1. Introduction

The industrial sector plays an important role in the growth and development of an economy. Over the years, Nigeria has instituted various policies and embarked on programmes aimed at developing her industrial sector and promoting economic growth. However, these policies and programmes have had negligible impact on industrial sector performance. For instance, industrial contribution to GDP dropped to 22.0 per cent in 2016, far below the world average[1] of 30.2 per cent recorded in the same year. The dismal performance of the industrial sector has been linked to low investment in the sector, inadequate infrastructure and a weak macroeconomic framework. The capital market plays an important role in providing long term funding for businesses to expand, and this is done through debt and equity instruments. A well-developed and efficient capital market has the capacity to provide the required funds for industrial growth and development.

From a firm-level perspective, this paper argues that the capital market provides the required funds for industrial sector expansion. This view is important for a country like Nigeria, where the industrial sector has recorded poor performance, despite various policies and programmes aimed at industrializing the economy. Therefore, this study aims to establish the impact of debt and equity financing on industrial sector performance, relative to other sectors in the Nigerian capital market. Lessons from the final outcome of this study can be used to inform policy as the country plans to boost manufacturing activities. To the best of our knowledge, this study is the first to use firm-level data and an extended period of time to empirically examine the impact of the capital market on industrial sector performance in Nigeria.

Following the introductory section, section 2 provides background information on the various industrial policies in Nigeria as well as the size of the capital market. Section 3 covers the review of past studies on the topic of

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[1] See https://www.cia.gov/library/publications/the-world-factbook/fields/2012.html

interest; section 4 gives detailed explanation on the theoretical framework and methodology; section 5 presents the results and discussion, while section 6 provides the summary and policy implications.

2.   Background of the Study

2.1 Industrial development policies in Nigeria

Over the past five decades, Nigeria has embarked on various policies and programmes aimed at increasing the productivity and growth of the industrial sector.[2] In the early 1960s to late 1970s, the country pursued an inward industrialization strategy known as the Import Substitution Industrialization (ISI) strategy. The ISI strategy was designed to reduce dependence on foreign trade and conserve foreign exchange by producing local products that were previously imported (Chete et al., 2011). The strategy aimed to increase domestic manufacturing capacity, generate more employment and preserve the country's foreign exchange. To achieve the ISI objectives, the federal government embarked on trade restriction measures to protect domestic manufacturing companies. Some of the measures considered by government included: granting of tax holidays, tax reliefs, and duty exemption on plants and machineries for producing intermediate products. During this period, government established the first industrial development bank in 1964, with the mandate of providing medium and long-term finance to privately-owned enterprises in Nigeria (Ezeoha, 2007).

The differences in technology and technical expertise between Nigeria and the developed economies made the industrial sector dependent on imported raw materials for manufacturing activities in the early 1970s. However, the sudden crash in global oil prices in the 1980s led to the partial collapse of the import-dependent industrial sector (Sola et al., 2013). In 1986, the government introduced the Structural Adjustment Programme (SAP) which aimed to reduce the high dependence on revenue from crude oil and promote non-oil exports. Also, SAP was designed to encourage the development and use of local raw materials as inputs, and reduce or stop dependence on imported ones. This policy

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[2] This refers to the goods producing sector of an economy, including Construction, Manufacturing, Electricity, Gas, Steam and Air Conditioning Supply and Mining and Quarrying.

led to a slight growth in the industrial sector, with mining and quarrying activities recording the highest growth rate of 31per cent in 1986 and 1987.

In order to promote small and medium enterprises (SMEs) and drive industrialization in Nigeria, government introduced the Small and Medium Industries Equity Investment Scheme (SMIEIS) in 2000/2001. In addition, the Bank of Industry was created in 2000, to drive industrial development through the provision of loans, equity finances and technical assistance to industrial enterprises. Other industrial policies and programmes such as the National Economic Empowerment and Development Strategy (NEEDS, 2004), National Integrated Industrial Development (NIID, 2007) and the Industrial Park Development strategy (IPDs, 2009) were also implemented in Nigeria. Despite these policy measures, the contribution of the industrial sector to GDP gradually declined from 1990 to 2016 (see figure 1). Specifically, industrial contribution to GDP fell from 46.6 per cent in 1990 to 31.6 per cent in 2006 and declined further to 21.9 per cent in 2016. This continuous decline could be linked to low investment in the sector, inadequate infrastructure and a weak macroeconomic framework.
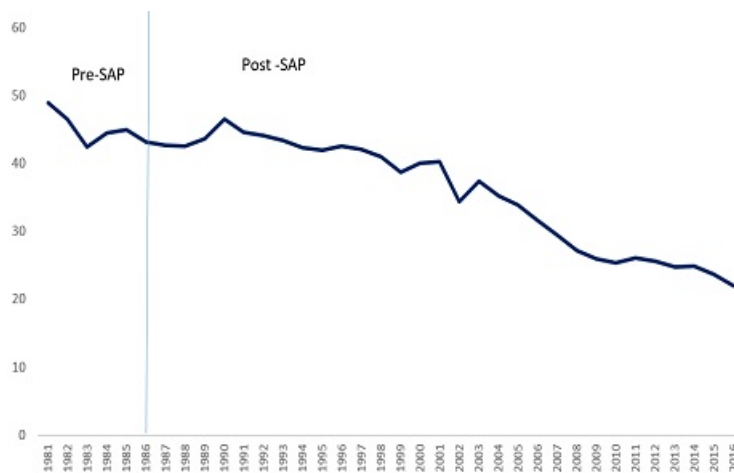

Figure 1. Trend of Industry Value Added (% of GDP).
Source: Author's computation, with underling data from *Central Bank Statistical Bulletin* (2015) and NBS GDP report Q1 2017.

2.2 The Nigerian capital market

The evolvement of the capital market in Nigeria, like in other developing countries, dates back to 1946 when the then British colonial government floated £300,000for local loans as first securities, with an interest rate of 3 per cent. There was not much activity until the 15th of September 1960, when the Lagos Stock Exchange was incorporated as a private liability company, limited by guarantee under the provision of the Lagos Stock Exchange Act 1960. The Exchange's trading activities on the Lagos floor of the Stock Exchange formally began on 5th June 1961 with 19 listed securities, made up of 6 federal government bonds, 3 equities and 10 industrial loans (Esosa, 2011). In December 1977, its name was changed from the Lagos Stock Exchange to the Nigerian Stock Exchange and additional branches have since been opened in Kaduna (1978), Port-Harcourt (1980), Kano (1989), Ibadan (1990), Onitsha (1990), Abuja (1999), Yola (2002) and some other major cities in the country.

The all share index (ASI) and market capitalization are two major indicators that track the performance of stocks listed on the Nigerian Stock Exchange. Figure 2 shows that over the past three decades, the all share index (ASI) and market capitalization exhibited significant improvements over time. The market maintained an upward trend from 1985 to 1997. ASI rose from 117.3 in 1985 to 7,638.6 in 1997, with an average of 1,808.2. Market capitalization grew from ₦5.1 billion in 1985 to ₦330.6 billion in 1997, with an average of ₦78.2 billion.

During transition from military regime to democracy, the market witnessed its first significant decline. The ASI fell by about 30 per cent in 1998 and 11 per cent in 1999, while market capitalization fell by 21 per cent in 1998 and 4 per cent in 1999. The post-election period witnessed a gradual increase in market indices; ASI grew by 652 per cent, from 6,701.1 in 2000 to peak at 50,424.7 in 2008. In 2009, it dipped sharply by 54.2 per cent. Similarly, market capitalization increased significantly from ₦370.7 billion in 2000 to ₦10,150.2 billion in 2008, while in 2009, it dipped by 47 per cent to ₦5,296.4 billion. The large decline during this period was largely attributed to the global financial crisis. Recently, the ASI has fluctuated between 23,393.64 in 2011 to 26,624 in 2016, while market capitalization grew from ₦6,493.30 billion in 2010 to peak at ₦12,924.38 billion in 2014.
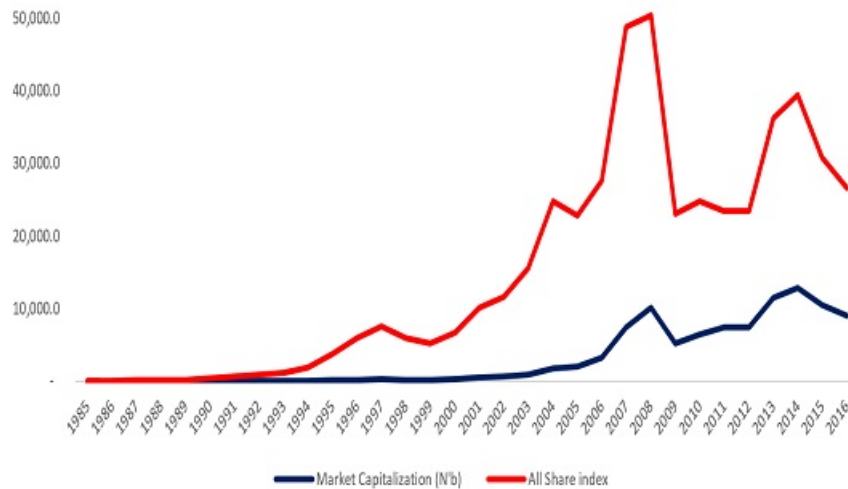
Figure 2: Trend of All Share Index (ASI) and Market Capitalization.
Source: Author's computation, with underling data from Central Bank Statistical Bulletin (2016).

There are four (4) major instruments traded on the bourse of the NSE – government securities, bonds/debts, exchange traded funds (ETF), and equities. Figure 3 shows the distribution of government securities, bonds/debt, ETF and equities traded on the NSE from 1985 to 2016. From the figure, it can be seen that equities accounted for the highest contribution to total market capitalization over the last three decades. The share of equities in total market capitalization rose from 41 per cent in 1985 to peak at 99 per cent in 2000. However, it fell slowly from 98 per cent recorded in 2001 to 71 per cent in 2009 and 58 per cent in 2015. Government securities accounted for a relatively large proportion of total market capitalization prior to the early 1990s. It declined slowly from 53 per cent recorded in 1985 to 1 per cent in 1996 through 1999. In 2002, the share of government securities in total market capitalization increased from 2 per cent to 29 per cent in 2009, and rose further to 41 per cent in 2015. Other securities such as bonds/debt and ETFs represent a small proportion of total market capitalization. Bonds/debt only accounted for 6 per cent of total market capitalization in 1985, and it dropped to 1 per cent in 1995, while in 2011 it rose to 13 per cent.
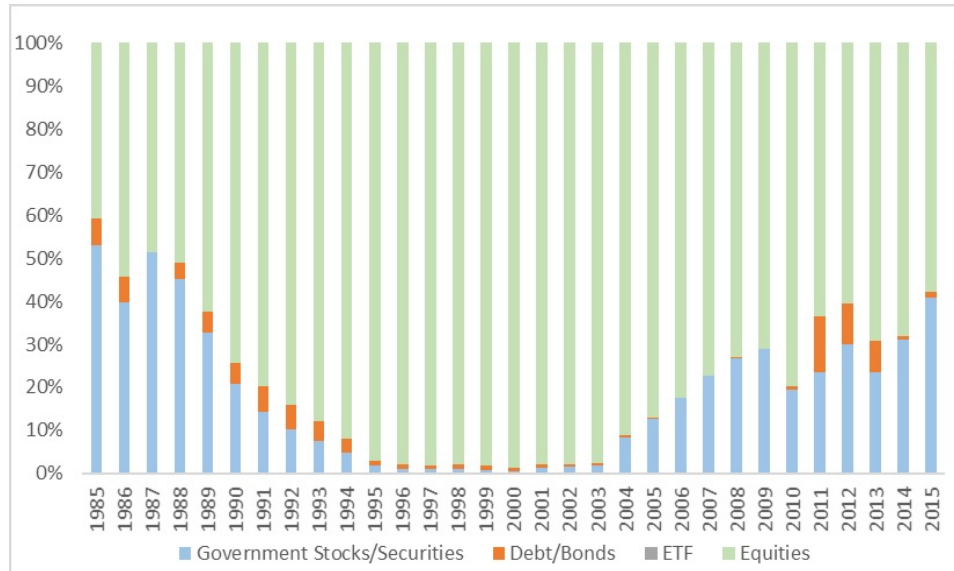
Figure 3. Distribution of Market Capitalization by Major Instruments Traded on the NSE.
Source: Author's computation, with underling data from Central Bank Statistical Bulletin, (2016)

2.3 Industrial classification of listed firms (Number and size)

The distribution of firms across various sectors is presented in table 1. In line with the National Bureau of Statistics (NBS) sectoral classification, we re-classified all firms listed between 1980 and 2016 into three broad sectors (agriculture, industry and services). As shown in the table, the services sector had the highest number of listed firms (143), closely followed by the industrial sector (123), and the agriculture sector (7). Similarly, in terms of size, the total assets of the services sector accounted for about 79 per cent of the total market assets, while the industrial sector accounted for 20 per cent of the total market assets. The agriculture sector had the least, as it only accounted for 1 per cent of the total market assets.

Table 1. Sectoral Distribution of Listed Firms (1980 to 2016)

Sector		Total Assets (N'billion)	Number of firms
Agriculture	Agriculture	3.99	7
Agriculture Total		**3.99**	**7**

Sector		Total Assets (N'billion)	Number of firms
Industry	Construction	16.28	6
	Electricity, Gas, Steam and Air Conditioning Supply	0.95	1
	Manufacturing	26.16	114
	Mining and Quarrying	11.66	2
Industry Total		**55.05**	**123**
Services	Accommodation and Food Services	9.38	4
	Administrative and Support Services	12.64	2
	Financial and Insurance	136.66	83
	Human Health and Social Services	1.05	2
	Information and Communication	4.57	14
	Professional, Scientific and Technical Services	2.94	3
	Real Estate	15.04	2
	Telecommunications and Information Services	15.77	1
	Trade (Wholesale and Retail)	14.38	25
	Transportation and Storage	4.07	7
Services Total		**216.50**	**143**

Source: Author's computation, with underlying data from companies' annual reports (various years).

3.   Literature Review

3.1 Evidence on financing and industrial performance

The impact of financing on industrial sector performance has been widely researched in the literature, with most studies focusing on economies with developed financial systems. Previous studies have accorded great importance to the role of bank credit financing in the development of new industries. They argued that banks are central actors of the real economy and they act as catalysts for industrialization and growth (Gerschenkron, 1962; Schumpeter, 1939). Rin and Hellmann (2002) provided a theory to explain the role of banks as a catalyst for industrialization. They showed that banks can act as a catalyst for industrialization if they are significantly large enough to provide financial support to manufacturing firms. The study indicated that banks have sufficient market power to coordinate industrial activities, promote economic growth and development. Stulz (2000) noted that banks are more proactive in funding new and innovative industries.

Beck and Levine (2002) examined the determinants of industrial growth patterns across countries. They addressed the issue of endogeneity of financial development using an instrumental variable regression technique. Their findings showed that financial development and effective contract enforcement mechanisms encourage expansion of new establishments. Burhop (2006) employed a vector auto regression (VAR) to examine the impact of growth of bank assets on the German industrialization process. Findings from the study support the bank-led industrialization hypothesis which states that banks act as a catalyst for the industrialization process. Specifically, they found that financing from joint-stock credit banks positively influenced capital formation and industrial growth in Germany.

Contrary to the bank-led industrialization hypothesis, a few studies noted that bank financing has an insignificant role in the industrial growth process. For instance, Edwards and Ogilvie (1996) reported that bank credit had an insignificant contribution in the economic development of Germany. La Porta et al. (2002) argued that state-owned banks are less likely to identify and fund truly strategic industries. Neuburger and Stokes (1974) reported that bank credit has a negative impact on Germany's growth process.

While most studies considered bank financing, few studies have focused on the relationship between capital market financing and industrial growth. Kominek (2003) examined the relationship between stock market and industry growth in Europe. Analysis from the study showed that industries with large dependence on capital market financing had higher performance compared to industries with less dependence on capital market financing. Also, the study revealed that high equity issuing industries had higher industrial growth compared to the low equity issuing industries in Europe. Ventura and Voth (2015) examined the influence of debt financing on industrial sector growth. They noted that countries with high borrowing/debt were the first to industrialize. Findings from the study showed that the massive issuance of liquidity traded bonds increased firm performance in new industries and accelerated industrialization.

In a related study, Barro (1987) argued that debt accumulation has a neutral effect on industrialization. Using industry-level data on 19 emerging markets, Li (2010) analysed the effect of equity market liberalization on industrial growth. Findings from the study revealed that industries with high dependence

on external financing experienced a significant higher growth in real value added. Similarly, Bernstein et al. (2010) found that industries with high private equity funds in the past five years grew rapidly in terms of productivity and employment, and they appeared to be less exposed to aggregate shocks.

3.2 Evidence on the impact of debt and equity on firm performance

Capital market financing often comes in the form of either debt or equity. The choice of debt or equity financing is arguably one of the most important choices faced by business managers. This is because financing decisions may affect financial risk and the value of a firm. Financial leverage refers to the use of more debt to acquire additional assets.

Existing studies have largely examined the effect of financial leverage on firm performance, but most of the studies arrived at mixed conclusions. The seminal work of Jensen and Meckling (1976) laid the foundation for several research works to examine the role of debt on firm performance. They argued that debt financing reduces taxable income (Modigliani and Miller, 1963); serves as a corporate disciplinary mechanism to reduce managerial wasteful spending (Jensen and Meckling, 1976); mitigates agency cost by reducing free cash flow (Jensen, 1986); and reduces the cost of bankruptcy or financial distress (Grossman and Hart, 1982).

In line with the above arguments, Bokpin and Arko (2009) argued that firms prefer to finance their company's operations with long-term debt rather than issuing equity, probably because of the benefit of debt (tax shield) which adds to shareholders' wealth maximization. Abor (2005) examined the effects of financial leverage on the profitability of 22 firms listed on the Ghana Stock Exchange (GSE). Their findings showed that Ghanaian firms largely depend on short-term debt for financing their operations, due to the difficulty in accessing long-term credit from financial institutions. Their findings revealed a positive relationship between short-term debt and profitability, implying that firms benefit from the tax shield of debt and this improves their performance. Ismiyanti and Mahadwartha (2007) argued that corporate debt constraints expropriation, reduces agency cost and improves firm performance in Indonesia. In a related study, Fosu (2013) indicated that financial leverage has positive effects on firm performance. The positive relationship established in the study

indicates that financial leverage is an effective corporate governance mechanism which reduces agency cost and improves firm performance.

On the other hand, few studies have argued that financial leverage negatively affects firm performance. Most of these studies focused on emerging or transition economies. They noted that firms with high leverage ratio have higher future cash outflow resulting from principal and interest payments. Also, higher leverage increases the probability of bankruptcy and financial distress. Ebaid (2009) and Salim and Yadav (2012) found that high cost of debt (interest payment) increases operating expenses which in turn lowers firm profitability. Harris and Raviv (1991) reported that firms often underestimate bankruptcy costs of liquidation, thus they employ more debt, which in turn lowers their performance. Adjei (2010) found a negative relationship between new debts borrowed during crisis period and corporate performance. Nwude et al. (2016), showed that debt structure significantly reduces the performance of listed firms on the Nigerian Stock Exchange. Singh and Faircloth (2005) studied the effect of corporate debt on long-term investment and firm performance. Using manufacturing firms from the United States (US), they found that higher leverage adversely influences future investment in R&D, which in turn leads to a decline in operating performance and future growth opportunities.

A few studies have empirically examined the influence of equity financing on firm performance. Most of the studies found that equity financing improves firm performance. Saad et al. (2014) reported that equity financing has significant positive impact on SMEs' performance in Malaysia. The study noted that SMEs in Malaysia employ equity financing as a major source of business capital because of its potential to increase firm performance. A similar result was also reported by Cassar and Holmes (2001). McLaughlin et al. (1996) indicated that firms that issued equity during the period 1980-1991 in the US, had higher operating performance. Similarly, Fu et al. (2002) found that equity financing significantly increases SMEs performance in Taiwan, while debt reduces performance.

4. Methodology

4.1 Method of analysis

This study employed the independent samples t-test and transcendental logarithmic (translog) production function. The independent samples t-test was

used to examine whether there is a significant difference between industrial value added and agricultural value added, as well as services value added. This was done by comparing the mean value added of the industrial, services and agricultural sectors. Similarly, the mean values of capital market financing (debt and equity) were compared to examine the differences in capital market financing across the three sectors.

To determine the impact of capital market financing on industrial sector performance, we estimated an augmented translog production function which incorporates debt and equity financing alongside the traditional labour and capital inputs. The translog production function was used to examine the relationship between production output and inputs. It has a flexible functional form which follows the second order Taylor series (Christensen et al., 1973). The general specification of the model is expressed as:

$$lnY = \alpha_0 + \beta_K lnK_t + \beta_L lnL_t + \frac{1}{2}\beta_{KK} lnK_t^2 + \frac{1}{2}\beta_{LL} lnL_t^2 + \beta_{KL} lnK_t lnL_t \qquad (1)$$

where:

Y is output at constant prices

K is capital stock at constant prices

L is labour.

Following Li (1996), we extended our definition of capital stock by incorporating two measures of financial capital (debt and equity). The inclusion of debt and equity financing allows us to measure the impact of capital market financing on industrial performance. However, a major drawback of using financial capital is that it ignores the time lag of conversion from financial capital to physical capital. Going by the above definition of capital inputs, equation (1) becomes:

$$lnIND = \alpha_0 + \beta_F lnFA_t + \beta_D lnDBT_t + \beta_E lnEQT_t + \beta_L lnLAB_t +$$
$$\frac{1}{2}\beta_{FF} lnFA_t^2 + \frac{1}{2}\beta_{DD} lnDBT_t^2 + \frac{1}{2}\beta_{EE} lnEQT_t^2 + \frac{1}{2}\beta_{LL} lnLAB_t^2 +$$
$$\beta_{FD} lnFA_t lnDBT_t + \beta_{FE} lnFA_t lnEQT_t + \beta_{FL} lnFA_t lnLAB_t +$$
$$\beta_{DE} lnDBT_t lnEQT_t + \beta_{DL} lnDBT_t lnLAB_t + \beta_{EL} lnEQT_t lnLAB_t + \mu_t \qquad (2)$$

where:

α_0 is a constant and β_F, β_D, β_E, β_L, β_{FF}, β_{DD}, β_{EE}, β_{LL}, β_{FD}, β_{FE}, β_{FL}, β_{DE}, β_{DL}, β_{EL} are parameters for various inputs; the subscript t refers to the time period; *IND* is industrialization and is used as a proxy for output; *LAB* is labour measured as the number of employees; *FA* is fixed asset used as a proxy for capital input; *DBT* is total debt; and *EQT* is equity financing.

4.2 Sample and data

This study used data of all publicly-listed firms on the Nigerian Stock Exchange (NSE) from 1980 to 2016. The data was obtained from the companies' annual reports and the sample selection was guided by data availability. The sample consists of 273 firms with a total of 22,496 observations for firm-year. All data were obtained from the Anastat (2017).

All variables were aggregated by taking the sectoral average in each period. This ensured that each of the variables only varied over time. The averaging technique reduced missing observations and allowed estimation of the regression using the OLS technique. In aggregating each variable, the National Bureau of Statistics sectoral classification (NBS) was adopted. It should be noted that the NSE classifies firms into 12 broad sectors. However, we re-classified all listed firms based on the NBS broad classification (agriculture, industry and services). Going by this classification, the sample consists of 7 firms in the agricultural sector, 123 firms in the industrial sector and 143 firms in the services sector. The NBS classification will enable corresponding price deflators to be obtained and the real values of key variables can be computed. The measurement of key variables in this study is given below:

Industrial Performance: Industrial performance was measured as the share of industrial real value added to total market value added. Total market value added refers to the sum of value added of all firms in the market. This measure is similar to the share of real manufacturing value added to GDP, used in previous studies. In addition to the above, industrial performance was also measured as the real value added of all firms in the industrial sector. To obtain the real value of industrial performance, we deflated the nominal industrial value added by industrial GDP deflator.

Equity: This is a measure of capital market financing. Equity financing refers to the value of the common and preferred stocks of a firm. To get the real value of equity, we deflated the nominal equity financing by industrial GDP deflator. A similar approach was used by Cummins and Zi (1996).

Debt: This is used to measure the amount of capital market financing. It refers to the act of raising capital by selling bonds, bills or notes to individual and/or institutional investors. In this study, we only considered total debt financing, which is proxied by total liabilities of firms. This definition has been used in previous studies (see Tauseef et al., 2015). To get real debt financing, we deflated the nominal total debt values by industrial GDP deflator.

Capital: This refers to the cost of the physical assets of a firm. It includes the cost of machinery and equipment, land and buildings, as well as inventories used in the production of goods and provision of services. Since capital stock is measured in monetary value, it depreciates and it is subject to changes in annual inflation. This suggests that all historical investments need to be converted to real monetary value (constant monetary term) for each year by a price index. In this study, capital is defined as the cost of the fixed assets of a company. In line with Filippini and Farsi (2004), we deflated the nominal capital by GDP inflator.

Labour: This can be measured in three ways: number of hours worked, number of employees, or cost of labour. In this study, labour is measured by the number of employees, based on data availability.

5.   Results and Discussion

5.1 Descriptive analysis

Table 2 shows the mean, standard deviations and t-test results of key variables considered in this study. The share of real value added of all firms in the industrial sector averaged 39.3 per cent, while the services sector had an average of 45.5 per cent. The t-test result indicates that mean value added differed in both sectors, with the services sector having higher value added. This suggests that the services sector performed better compared to the industrial sector. On the average, debt financing in the industrial sector was ₦134.7 million, while services sector debt financing stood at ₦654.7 million. Comparing the level of debt, the t-test result indicates a significant difference in debt financing between the industrial sector and the services sector. This suggests that the industrial

sector employed less debt financing compared to the services sector. The average value of equities in the industrial sector was ₦86.8 million, while the services sector had an average of ₦136.6 million. The t-test result indicates that the services sector employed more equity financing compared to the industrial sector.

Further, the average value of fixed assets of firms in the industrial sector stood at ₦148.4 million, while in the services sector, it was ₦41.7 million. The result indicates that fixed assets differed in the sectors and the industrial sector employed more fixed assets. In addition, the value of total employees in the industrial sector was significantly higher compared to the value in the services sector. The industrial sector employed an average of 1,450 workers compared to 1,184 workers in the services sector.

Table 2. Test of Difference between Industrial Sector and Services Sector Indicators

		Industry Vs Services sector		
Indicator	Category	Mean	Standard deviation	Std. Error
Share of real value added (per cent)	Industrial sector	39.3	8.9	1.5
	Services sector	45.5	15.7	2.6
	t-test	-6.2**		
Debt (₦'m)	Industrial sector	134.7	61.8	10.2
	Services sector	654.7	578.9	95.2
	t-test	-520***		
Equity (₦'m)	Industrial sector	86.8	50.9	8.4
	Services sector	136.6	124.4	20.5
	t-test	-49.8**		
Total employment	Industrial sector	1450	455.6	74.9
	Services sector	1184	801.3	139.5
	t-test	266*		
Fixed asset (₦'m)	Industrial sector	148.4	110.1	18.1
	Services sector	41.7	31.5	5.1
	t-test	106.7***		

Note: *,** and *** indicate significance at 10 per cent, 5 per cent and 1 per cent respectively.

Table 3 presents the descriptive statistics and t-test results of all firms in the industrial and agricultural sectors. The share of real value added in the industrial sector differed significantly from the share of real value added in the agricultural sector, with the industrial sector having a higher share. On the average, the share

of real value added in the industrial sector was 39.3 per cent, while in the agricultural sector, it stood at 18.1 per cent.

In line with our expectation, the industrial sector employed significantly higher debt compared to the agricultural sector. The average debt financing in the industrial sector was ₦134.7 million, while in the agricultural sector it was ₦35.9 million. Conversely, the agricultural sector employed more equity financing compared to the industrial sector. On the average, equity financing in the industrial sector was ₦86.9 million, which is far lower than the ₦284.4 million recorded in the agricultural sector.

On the average, fixed asset in the industrial sector was ₦148.4 million while in the agricultural sector it stood at ₦32.9 million. The result shows that the industrial sector employed more fixed assets compared to the agricultural sector. Total employees in the industrial sector were significantly higher compared to the services sector. The average number of employees in the industrial sector was 1,450 against 1,184 in the services sector.

Table 3. Test of Difference between Industrial Sector and Agricultural Sector Indicators

	Category	Industry vs Agriculture sector		
		Mean	Standard deviation	Std. Error
Share of real value added (per cent)	Industry sector	39.3	8.9	1.5
	Agriculture sector	18.1	9.2	1.7
	t-test	21.2***		
Debt	Industry sector	134.7	61.8	10.2
	Agriculture sector	35.9	24.1	4
	t-test	98.8***		
Equity	Industry sector	86.8	50.9	8.4
	Agriculture sector	284.4	697	114.6
	t-test	197.6*		
Total Employment	Industry sector	1450	455.6	74.9
	Agriculture sector	1100	827.3	148.6
	t-test	350**		
Fixed Asset	Industry sector	148.4	110.1	18.1
	Agriculture sector	32.9	24.1	4
	t-test	115.5***		

Note: *,** and *** indicate significance at 10 per cent, 5 per cent and 1 per cent respectively.

5.2 Regression results

A major focus of this study is to examine the impact of capital market financing on industrial performance. However, for comparison, we also estimated the impact of capital market financing on non-industrial[3] sector performance (agricultural and services sectors).

Table 4 reports the estimates of the industrial performance equation, using the ordinary least squares (OLS) regression technique. In Model 1, we measured industrial performance by the share of real industrial value added to total market value added, while in Model 2, we measured industrial performance by real value added of all listed firms in the industrial sector.[4] The results show that external financing through the capital market enhanced industrial performance in Nigeria. The coefficient of equity financing is statistically significant, indicating that equity financing aids industrialization. This result is similar to results obtained by Bernstein et al. (2010) and Kominek (2003). This is plausible given that equity financing could be used to mobilize the required resources for business expansion. Similarly, we found a positive relationship between debt financing and industrial performance. This suggests that debt financing promotes industrialization in Nigeria. A similar result was also reported by Ventura and Voth (2015).

While debt and equity financing have a positive link with industrialization, the coefficient of equity financing is higher compared to debt. This implies that industries with more equity financing will perform better compared to industries with less equity financing. This result is similar to the findings of Fu et al. (2002). A similar result was obtained when we compared the results from the industrial sector with the estimates from the agricultural and services sectors, however, debt and equity financing impacted more on the services sector.

Furthermore, the result shows that there exists a turning point where further increases in capital market financing will slow down the industrialization process. This suggests that there is an optimal amount of debt and equity that promotes industrialization. A similar result was also obtained when the agricultural and services sectors were considered. The coefficient of labour input

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[3] See Appendix A for regression results on the agriculture and services sectors

[4] A similar measure was used for agriculture and services sector performance

has a positive relationship with industrial performance, indicating that higher labour promotes industrialization in Nigeria.

Table 4. Regression Results on the Impact of Capital Market Financing on Industrial Performance

	-1	-2
	Share of real industrial value added	Real industrial value added
FA	-3.037 (3.795)	-0.073*** (0.017)
DBT	12.068(15.960)	0.105*** (0.015)
EQT	17.793* (9.242)	0.131*** (0.015)
LAB	8.980*** (3.012)	0.049*** (0.010)
FA^2	0.420***(0.128)	-0.010*** (0.002)
DBT^2	-0.411 (0.927)	-0.001 (0.002)
EQT^2	-1.448** (0.676)	0.006*** (0.001)
LAB^2	-0.107*** (0.027)	-0.005*** (0.001)
FA*LAB	-0.874* (0.504)	0.018*** (0.003)
FA*EQT	0.355 (0.501)	0.005** (0.003)
FA*LAB	-0.090 (0.062)	0.000 (0.002)
DBT*EQT	0.928 (1.209)	-0.022*** (0.003)
DBT*LAB	-0.494* (0.250)	0.003* (0.002)
EQT*LAB	-0.100 (0.186)	-0.001 (0.002)
Constant	-171.557* (92.396)	0.742*** (0.048)
R-squared	0.737	0.898
Adjusted R-squared	0.57	0.897
F- Statistics (prob.)	4.41 (0.001)	1025.33 (0.000)

Notes: (i) dependent variable in Model 1 is Share of value added; dependent variable in Model 2 is the value added of all firms in the industrial sector. (ii) *,** and *** indicate significance at 10 per cent, 5 per cent and 1 per cent respectively

6.   Summary and Conclusion

This study examined the role of the capital market in Nigeria's industrialization process. It employed a data set of 273 firms listed on the NSE from 1980 to 2016, with a total of 22,496 observations for firm-year. Data were obtained from companies' annual and financial reports for various years. The study re-classified listed firms into three broad sectors based on the National Bureau of Statistics sectoral classification. All variables were aggregated across industries, using simple average. The independent samples t-test was employed to determine whether mean value of real value added differs by industry. Also, we

estimated an augmented transcendental logarithmic (translog) production function to determine the role of capital market financing in industrialization. The augmented translog production was estimated using the OLS regression technique.

Results from the study show that the industrial sector employed more capital market financing (debt and equity) and they performed better than firms in the agricultural sector in terms of their contribution to the economy. On the other hand, firms in the services sector relied more on capital market financing and performed better than firms in the industrial sector. The findings show that debt and equity financing have a positive significant impact on industrial performance in Nigeria. This suggests that industrialization is driven by capital market financing. Based on these findings, it is recommended that capital market financing should be redirected towards improving industrial sector growth.

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Appendix A: Regression Results

	Share of real value added			Real value added of all firms in each sector		
	Agriculture	Industry	Services	Agriculture	Industry	Services
FA	8.603	-3.037	6.286	-0.892***	-0.073***	-0.048***
	(14.078)	(3.795)	(11.211)	(0.207)	(0.017)	(0.013)
DBT	1.347	12.068	6.379	0.227*	0.105***	0.093***
	(10.482)	(15.960)	(8.489)	(0.127)	(0.015)	(0.013)
EQT	-4.907	17.793*	1.017	1.469***	0.131***	0.105***
	(7.774)	(9.242)	(3.761)	(0.209)	(0.015)	(0.014)
LAB	0.584	8.980***	5.281	0.602***	0.049***	-0.003
	(2.659)	(3.012)	(3.080)	(0.096)	(0.010)	(0.012)
FA^2	-2.124*	0.420***	-0.224	0.027	-0.010***	-0.003***
	(1.102)	(0.128)	(1.603)	(0.036)	(0.002)	(0.001)
DBT^2	-1.884*	-0.411	0.240	0.016	-0.001	0.003**
	(0.992)	(0.927)	(0.640)	(0.013)	(0.002)	(0.001)
EQT^2	-0.122	-1.448**	0.022	0.015	0.006***	-0.000
	(0.123)	(0.676)	(0.319)	(0.013)	(0.001)	(0.001)
LAB^2	-0.175	-0.107***	-0.052	-0.029***	-0.005***	0.004***
	(0.106)	(0.027)	(0.053)	(0.007)	(0.001)	(0.001)
FA*LAB	3.099	-0.874*	-0.478	0.013	0.018***	0.002
	(1.842)	(0.504)	(2.166)	(0.041)	(0.003)	(0.002)
FA*EQT	0.526	0.355	0.540	-0.044	0.005**	0.003*
	(0.472)	(0.501)	(0.414)	(0.040)	(0.003)	(0.002)
FA*LAB	-0.786	-0.090	-0.425	0.087***	0.000	0.016***
	(0.509)	(0.062)	(0.485)	(0.018)	(0.002)	(0.002)
DBT*EQT	0.294	0.928	-0.585	-0.050	-0.022***	-0.007***
	(0.904)	(1.209)	(0.632)	(0.033)	(0.003)	(0.002)
DBT*LAB	0.952**	-0.494*	-0.141	-0.019*	0.003*	-0.016***
	(0.427)	(0.250)	(0.301)	(0.010)	(0.002)	(0.002)
EQT*LAB	-0.090	-0.100	0.119	-0.089***	-0.001	-0.001
	(0.115)	(0.186)	(0.086)	(0.017)	(0.002)	(0.002)
Constant	-29.041	-171.557*	-88.854*	-4.930***	0.742***	0.942***
	(82.468)	(92.396)	(44.968)	(0.718)	(0.048)	(0.051)
R-squared	0.755	0.737	0.843	0.928	0.898	0.879
Adjusted R-squared	0.51	0.570	0.714	0.913	0.897	0.878
F- Statistics	3.08	4.41	6.55	59.46	1025.33	692.3
(prob.)	(0.02)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)

*,** and *** indicate significance at 10 per cent, 5 per cent and 1 per cent respectively