

# The Effect of the Industrial Sector on Firms' Performance In A Multi-Cultural Economy

Olokoyo, Felicia Omowunmi

Department of banking & finance, College of development studies,  
Covenant university, Km 10, idiroko road, P.m.b 1023, ota, ogun state, Nigeria.

[felicitymy79@gmail.com](mailto:felicitymy79@gmail.com), [felicia.olokoyo@covenantuniversity.edu.ng](mailto:felicia.olokoyo@covenantuniversity.edu.ng)

## ABSTRACT

This paper presents empirical findings on the impact of the industrial sector on the performance of firms in a culturally diverse nation like Nigeria. The main objective of the study is to determine the overall effect of the industry in which a firm operates in a multicultural economy on its performance. The study opines that the cultural diversity of the Nigerian citizenry could determine to an extent the performance of a given firm in an industry and how the national economic policies affect its operation. It examines the relationship that exist between the industrial sector of quoted firms in Nigeria and their return on assets (as an accounting performance measure) and Tobin's Q (as a market performance measure). The study employed panel data analysis using the Random Effect Model which is best suited for the data set, since there is need to control for the effect of the industrial sector on firms' performance. The study shows that the industrial sector dummy variables are not significantly related to the accounting measure of performance (ROA) but have a significant relationship with the market performance (Tobin's Q). The study concludes that regardless of the diverse cultural citizenship values in Nigeria, there is presence of the industrial sector in the economy. The study therefore recommends that Nigerian firms should strive to match their high market performance with real internal activities/operations that would reflect or rub-off on their internal growth and accounting performance.

**Keywords:** *Multicultural economy, Firm performance, Industrial sector, Economic policies*

## 1. INTRODUCTION

Multiculturalism relates to communities containing multiple cultures. It is a term used to describe the belief that several different cultures can coexist peacefully and equitably in a single country. The term can be used in two broad ways, either descriptively or normatively (Heywood, 2000). As a descriptive term, it usually refers to the simple fact of cultural diversity: it is generally applied to the demographic make-up of a specific place, sometime at the organizational level, e.g. schools, businesses, neighborhoods, cities, or nations. As a normative term, it refers to ideologies or policies that promote this diversity or its institutionalization; in this sense, multiculturalism is a society "at ease with the rich tapestry of human life and the desire amongst people to express their own identity in the manner they see fit" (Bloor, 2010)

Opportunities abound for firms operating in a multicultural economy which they could take advantage of for better performance. The co-alignment principle states that "if the firm is able to identify the opportunities that exist in the forces driving change, invest in competitive methods that take advantage of these opportunities, and allocate resources to those that create the greatest value, the financial results desired by owners and investors have a much better chance of being achieved" (Olsen et al. 1998). Industries in a multicultural nation operate in relatively more dynamic, uncertain, and complex environment and firms in general depend upon their environments for both survival and success.

In literature, some empirical evidences have shown that the environment firms operate in plays a significant role in inducing firms to adapt, with the attendant consequences for firm performance (see Miller 1987; Miller and Friesen 1983). Some researchers (Bourgeois 1984; Child 1972) also suggest that organizations proactively manipulate their environments or create new environments (e.g., by exploiting technology developments, bringing about market changes) to achieve their objectives.

Does the cultural diversity of the Nigerian citizenry determine to an extent the performance of a given firm in an industry and how the national economic policies affect its operation? What effect does the belief and values of the different cultural groups exert on the activities and operations of firms in a given geographical location? How can this performance be enhanced in a culturally diversified economy? This paper seeks to find answers to these questions. The paper is divided into five sections. Following this introductory section is the literature review. Section three discusses the methodology, model and sources of data. In section four, the data are analyzed and the results discussed while the conclusion is shown in section five.

## 2. LITERATURE REVIEW

According to Gleason, Marthur and Marthur (2000), unlike participants in certain types of athletic endeavors, corporate managers do not have instant access to performance-enhancing quick fixes. Thus, they have to draw on their managerial expertise in using the tried and true as well as yet untried methods to improve corporate

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performance. Porter (1980) argues that different firm-specific strategies deployed by managers to gain competitive advantage result in intra-industry performance differences. He describes five forces that drive industry competition: potential entrants, suppliers, buyers, industry competitors, and substitutes. He reports entry barriers to be scale, differentiation, capacity requirements, switching costs, distribution channel access, raw material access, government policy, and retaliations.

In practice, firms from different industrial sector differ from one another in respect of size, nature, earnings, cost of funds, competitive conditions, market expectations and risk. Firms with reasonably stable levels of demand, and products with stable prices have stable revenues that result in low levels of fixed costs. Firms with highly volatile demand, products and prices have unstable revenues that result in high levels of business risk. Cost stability is concerned with the relative predictability of input price. The more predictable and stable these input prices are, the lower is the business risk, and vice-versa. Business risk varies among firms, regardless of the line of business, and is not affected by capital structure decisions (Krishnan and Moyer, 1997).

The structure of firms varies from one industrial sector to another and so do their optimal capital structures (see Bradley, Jarrell and Kim, 1984). Also, a firm's growth and business cycle varies from one industry to another. Since capital structure, risk, growth, business cycle, and a firm's access to external sources of funds, and the sensitivity to external stocks, vary across industries, the corporate profitability could be affected by the industrial sectors (Tian and Zeitun, 2007). Therefore, the industrial sector is expected to have an impact on corporate performance.

According to Murphy et al. (1996), research on firm performance can be traced to organization theory and strategic management. Performance measures are either financial or organisational. Financial performance such as profit maximization, maximizing profit on assets and maximizing shareholders' benefits are at the core of firm's effectiveness (Chakravarthy, 1986, Tian and Zeitun, 2007). Tian and Zeitun (2007) further states that the usefulness of a measure of performance may be affected by the objective of a firm which could in turn affect its choice of performance measure and the development of the stock market. For example, if the stock market is not highly developed and active, then the market performance measures may not provide a good result.

### 3. METHODOLOGY

#### 3.1 Model Specification

The most common performance measure proxies that have been used by many authors are return on assets (ROA), return on equity (ROE) and/or return on investment

(ROI) [see Krishnan and Moyer (1997), Tian and Zeitun (2007)]. However, the ROA is widely regarded as the most useful measure to test firm performance. Other measures of performance called market performance measures are price per share to the earnings per share and Tobin's Q which mixes market value with accounting value and has been used to measure the firm's value in many studies [Zhou (2001) and Tian and Zeitun (2007)]. In this study, two measures of corporate performance were used – ROA and Tobin's Q. The researcher used the proxy- ROA as an accounting performance measure and the (Tobin's Q) as a market performance measure. More than one proxy for performance were used in this study in order to investigate whether the independent variables explain the performance measures (accounting and market) at the same level or not.

It has been established empirically that larger size is associated with higher performance Gleason, Marthur and Marthur (2000). Therefore, it is expected that the larger industries in Nigeria will perform better in the face of competition. Hence, Size is introduced into the model as a control variable.

Also a firm's performance in a given industry cannot be divorced from the use of fund. According to Stohs and Mauer (1996), firms with high business risk tend toward less levered capital structure, and vice-versa. So leverage (a measure of capital structure) is also introduced into the model as a control variable. In this light, three measures of leverage were also used in the study:

- a. The ratio of total debt to total assets (TD/TA);
- b. The ratio of long term debt to total assets (LTD/TA); and
- c. The ratio of short term debt to total assets (STD/TA).

Accordingly, a functional relationship between firms' performance (PER) and the chosen explanatory variables (size, different measures of leverage and industrial sector dummies) is shown below:

$$PER = f(LEV, S, INDUST) \quad (1)$$

With:

$$\begin{aligned} (PER)' &= (ROA, \text{Tobin's } Q)' \\ (LEV)' &= (Lev1, Lev2, Lev3)' \end{aligned}$$

PER represents the different measures of performance (ROA and Tobin's Q) and LEV shows the different measures of leverage (Lev1, Lev2, Lev3), S connotes the size of the firms and INDUST represents the industrial sectors' dummy variables.

Where:

ROA = Return on asset and is measured by earnings before interest and tax (EBIT) divided by total assets

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Tobin's Q = Market value of equity plus total debt to total asset [(E+TD)/TA]

Lev1 = the ratio of total debt to total asset (TD/TA)

Lev2 = the ratio of long term debt to total asset (LD/TA)

Lev3 = the ratio of short term debt to total asset (STD/TA)

S = Size of the firm measured by log of turnover

The relationships between the components of PER and the different independent variables can be re-written implicitly as follows:

$$y_{it} = \alpha_0 + \alpha_1 Lev_{it} + \alpha_2 Size_{it} + \alpha_3 INDUST_{it} + \alpha_4 + \mu_{it} \quad (2)$$

To examine the effect of industrial sectors on firms' performance, 26 dummy variables are used. Sector 1 (Agric/Agro-Allied), Sector 2 (Airline Services), Sector 3 (Automobiles and Tyre), Sector 4 (Breweries), Sector 5 (Building Materials), Sector 6 (Chemical and paints), Sector 7 (Commercial/Services), Sector 8 (Computer and Office Equipment), Sector 9 (Conglomerate), Sector 10 (Construction), Sector 11 (Emerging Markets), Sector 12 (Engineering Technology), Sector 13 (Food/Beverages and Tobacco), Sector 14 (Healthcare), Sector 15 (Hotel and Tourism), Sector 16 (Industrial/Domestic Products), Sector 17 (Information Communication and Telecommunication), Sector 18 (Machinery), Sector 19 (Maritime), Sector 20 (Media), Sector 21 (Packaging), Sector 22 (Petroleum), Sector 23 (Printing and Publishing), Sector 24 (Real Estate), Sector 25 (Road Transportation) and Sector 26 (Textiles). The dummy variable takes the value 1 if the firm is in that sector; otherwise it takes the value 0.

**Apriori expectation:** Theoretically, there is an expectation of a significant negative relationship between the performance indicators and all measures of leverage but a significant positive relationship between size and performance and industrial sector and performance i.e.  $\alpha_1, \alpha_2, \alpha_3 < 0, \alpha_4, \alpha_5 > 0$ .

### 3.2 Methods of Estimation

This regression model takes the form of the Random Effects Model. The Random Effects model is better suited for the data set, since we need to control for the effect of the industrial sectors on firm performance and the Fixed Effects Model cannot allow us to control for the effect of the industrial sectors. The reason is that the industrial dummies do not change over time and, so, are not being reported in the Fixed Effects Model.

### 3.3 Data Collection, Study Population and Sample Size

From the population of 226 firms from 32 subsectors listed on the Nigerian Stock Exchange (NSE)

market, a sample of 101 non-financial quoted companies from 26 subsectors were purposively selected for analysis. The study excludes companies from the financial and securities sector as their financial characteristics and use of leverage are substantially different from other companies. First, their leverage is strongly influenced by explicit investor insurance scheme such as deposit insurance and regulations such as the minimum capital requirements may directly affect their capital structure. Secondly, their debt-like liabilities are not strictly comparable to the debt issued by non-financial firms. Moreover, the balance sheets of the firms in the financial sectors (banks, insurance companies, mortgage companies, leasing, unit trust and funds, real estate, investment trust and other financial institutions) have a strikingly different structure from those of non-financial companies. Other companies whose financial reports were not up to date and that are no longer in existence as at 2007 (e.g. companies in the Aviation Sector) were also excluded. As a result, the final sample set consists of a balanced panel of 101 firms from 26 subsectors over a period of five years.

The structure and distribution of the sample are shown in tables 1 – 3 below:

**Table 1:** Sample Selection by Sector Categorization

Population of Nigerian Quoted Firms	226
Firms in the Financial Sector	92
Actual Workable Population	134
Firms with Data irregularities	33
Total Sample selected	101 (75.4%)

Source: Author's computation from the Nigerian Stock Exchange (NSE) Fact book (2008)

**Table 2:** Structure of the Sample used in the study

Number of annual observation per company	Number of companies	Number of observations
5	101	505

Source: Author's computation from the Nigerian Stock Exchange (NSE) Fact book (2008)

**Table 3:** Sample Distribution by Subsector Classification

S/N	Sub-sectors	No of Companies	% Companies
1	Agric/Agro-Allied	6	5.94
2	Airline Services	2	1.98
3	Automobiles and Tyre	3	2.97
4	Breweries	4	3.96
5	Building Materials	6	5.94
6	Chemical and Paints	6	5.94
7	Commercial/Services	3	2.97
8	Computer and Office Equipment	4	3.96
9	Conglomerate	7	6.93
10	Construction	4	3.96
11	Emerging Markets	4	3.96
12	Engineering Technology	2	1.98
13	Food/Beverages and Tobacco	10	9.90
14	Healthcare	5	4.95
15	Hotel and Tourism	3	2.97
16	Industrial/Domestic Products	5	4.95
17	Information Comm. & Telecomm	2	1.98
18	Machinery	1	0.99
19	Maritime	1	0.99
20	Media	1	0.99
21	Packaging	8	7.92
22	Petroleum	8	7.92
23	Printing and Publishing	3	2.97
24	Real Estate	1	0.99
25	Road Transportation	1	0.99
26	Textiles	1	0.99
Total		101	100.0

Source: Author's computation from the Nigerian Stock Exchange (NSE) Fact book (2008)

#### 4. EMPIRICAL RESULT AND DISCUSSION

**Table 4:** Estimation Results for Panel Data Model including Variables for Industrial Sector for the 101 sample firms for the period 2003 – 2007

Dependent Variables ROA & Tob Q

Independent Variab	TDTA		LTDTA		STDTA	
	ROA	TOB Q	ROA	TOB Q	ROA	TOB Q
Constant	-0.5058 (-1.1388)	0.4349 (2.6330)***	-0.0819 (-0.2032)	0.8937 (1.2850)	-0.9221 (-1.9731)**	1.9251 (4.1897)***
Leverage	-0.1802 (-7.6307)***	1.0057 (118.85)***	-0.5416 (-12.915)***	1.2471 (16.776)***	-0.0645 (-2.0356)**	1.1057 (35.851)***
Size	0.0448 (2.2494)**	-0.0226 (-2.4671)**	0.0292 (1.5888)	-0.1394 (-3.754)***	0.0786 (3.867)***	-0.1365 (-5.416)***
Dum-Agric	0.5494 (1.2476)	-0.1902 (-1.1015)	0.2056 (0.5156)	0.7455 (1.0667)	0.6095 (1.3045)	-0.7308 (-1.5364)
Dum-Airline	0.4895 (1.0623)	-0.1872 (-0.9374)	0.2776 (0.6633)	0.1439 (0.1874)	0.6058 (0.6437)	-0.5868 (-1.0916)

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Dum-Auto	0.3578 (0.7929)	-0.1396 (-0.7476)	0.0282 (0.0687)	0.4321 (0.5874)	0.4950 (1.0369)	-0.7950 (-1.5664)
Dum-Breweries	0.2788 (0.6242)	-0.0669 (-0.3710)	-0.0507 (-0.1254)	0.9919 (1.3806)	0.3049 (0.6438)	-0.4938 (-1.0002)
Dum-Building	0.4451 (1.0088)	-0.1808 (-1.0461)	0.1006 (0.2518)	0.4528 (0.1874)	0.5778 (1.2359)	-0.8525 (-1.7916)*
Dum-Chemicals	0.4802 (1.0891)	-0.0798 (-0.4621)	0.2226 (0.5580)	0.4173 (0.5968)	0.5866 (1.2554)	-0.5513 (-1.1594)
Dum-Computer	0.2324 (0.5604)	-0.1020 (-0.7752)	0.0719 (0.1932)	0.4426 (0.7358)	0.2634 (0.5966)	-0.2545 (-0.6623)
Dum-Conglomerate	0.5230 (1.1872)	0.0438 (0.2560)	0.2103 (0.5272)	0.5453 (0.7828)	0.6670 (1.4291)	-0.5860 (-1.2420)
Dum-Construction	0.4694 (1.0512)	-0.2427 (-1.3458)	0.0448 (0.1107)	1.1513 (1.6022)	0.4790 (1.0104)	-0.8160 (-1.6516)*
Dum-Emergmkt	0.3737 (0.8384)	0.1660 (0.9232)	-0.0030 (-0.0074)	0.6166 (0.8583)	0.5650 (1.1983)	-0.7063 (-1.4380)
Dum-Engtech	0.3322 (0.7221)	0.7316 (3.6671)***	-0.0275 (-0.0657)	1.2894 (1.6784)*	0.4892 (1.0062)	-0.0340 (-0.0633)
Dum-Foodbev	0.4528 (1.0345)	-0.1523 (-0.9107)	0.1767 (0.4467)	0.5377 (0.7834)	0.5294 (1.1401)	-0.5821 (-1.2559)
Dum-Healthcare	0.4253 (0.9592)	-0.1732 (-0.9857)	0.1086 (0.2702)	0.2673 (0.3776)	0.5842 (1.2445)	-0.8501 (-1.7628)*
Dum-Hotel	0.3963 (0.8786)	-0.0963 (-0.5156)	0.0808 (0.1972)	0.5470 (0.7439)	0.5082 (1.0644)	-0.6738 (-1.3265)
Dum-Indus prod	0.4758 (1.0733)	-0.0445 (-0.2529)	0.2051 (0.5110)	0.4851 (0.6859)	0.5845 (1.2447)	-0.5361 (-1.1112)
Dum-InfoTech	0.4061 (0.8817)	-0.2458 (-1.2304)	0.1411 (0.3375)	0.5597 (0.7290)	0.4470 (0.9176)	-0.5931 (-1.1025)
Dum-Machinery	0.4992 (1.0177)	-0.3397 (-1.4421)	0.1241 (0.2763)	-0.0490 (-0.0565)	0.7179 (1.3912)	-1.3094 (-2.1051)**
Dum-Maritime	0.4516 (0.9246)	-0.0563 (-0.2402)	0.1541 (0.3450)	0.2680 (0.3113)	0.6242 (1.2136)	-0.7283 (-1.1776)
Dum-Media	0.2543 (0.5200)	-0.1394 (-0.5947)	-0.1049 (-0.2343)	0.2607 (0.3025)	0.4508 (0.8758)	-0.9570 (-1.5466)
Dum-Packaging	0.3561 (0.8111)	-0.1918 (-1.1329)	0.0549 (0.1381)	0.4076 (0.5893)	0.4681 (1.0059)	-0.7509 (-1.6049)
Dum-Petroleum	0.4633 (1.0547)	-0.1693 (-0.9988)	0.1297 (0.3262)	0.6551 (0.9462)	0.5463 (1.1725)	-0.7155 (-1.5263)
Dum-Printing	0.5365 (1.1895)	-0.1113 (-0.5962)	0.2001 (0.4884)	0.3339 (0.4540)	0.7065 (1.4811)	-0.8498 (-1.6752)*
Dum-Realest	0.3141 (0.6423)	-0.2682 (-1.1437)	-0.0728 (-0.1625)	0.4556 (0.5283)	0.4548 (0.8827)	-1.0258 (-1.6558)*
Dum-Roadtrans	0.4272 (0.8742)	-0.1822 (-0.7775)	0.1254 (0.2808)	0.3324 (0.3861)	0.5596 (1.0870)	-0.7770 (-1.2553)
Dum- Services	0.6631 (1.5614)	0.1199 (0.6641)	0.4560 (1.1837)	0.7570 (0.0803)	0.6957 (1.5478)	-0.1549 (-0.3171)
Dum-Textiles	0.1951 (0.3981)	-0.2375 (-1.0113)	-0.1379 (-0.3076)	0.3654 (0.4230)	0.3315 (0.6421)	-0.8703 (-1.4023)
No. of Observations	505	505	505	505	505	505
R-Square	0.1782	0.9697	0.3048	0.5367	0.0908	0.7589
F-Statics	3.5539	525.13	7.1825	13.5146	1.6375	51.5730
Durbin-Watson stat	2.0550	1.4510	1.8759	1.3542	2.0836	1.9587
Hausman Chi-Square	9.3804	17.3630	27.3391	1.0217	2.4994	3.2838
P-Value (Chi-Square)	(0.0520)*	(0.0016)***	(0.000)***	(0.9065)	(0.6447)	(0.0511)*

**Note:** \*\*\* Significant at 1% level; \*\* Significant at 5% level and \* Significant at 10% level. Numbers in parentheses are the asymptotic t-values of the co-efficient. ROA = the return on assets (EBIT/ total assets); Tob Q (Tobin's Q) = Market value of equity + book value of debt/book value of assets; TDTA = total debt divided by total assets; LTDTA = long-term debt divided by total assets; STDTA = short term debt divided by total assets; Size = log of turnover, Dum refers to the dummy variables for industry, Leverage refers to TDTA, LTDTA or STDTA.

**Source:** Results obtained from data analysis using the E-Views statistical software package

From the regression results in Table 4, it is interesting to note that the coefficient of the leverage measures and size are significant for both the ROA estimation and the Tobin's Q estimation. However, the result shows that none of the industrial sector dummy variables are significantly related to the accounting measure of performance ROA using TDTA, LTDTA or STDTA as a measure of capital structure. The insignificant impact of these dummy variables indicates that a higher level of investment in these sectors may not be associated with a higher level of ROA though the apriori expectation predicted a significant positive relationship between the industrial sectors and corporate performance of Nigerian firms. The research further investigates the effect of the Industrial Sector on corporate performance and whether the significance of the firm's performance measures will be affected as the control variables are added to the model. From the regression results in Table 4, it is interesting to note that the coefficient of the leverage measures and size are significant for both the ROA estimation and the Tobin's Q estimation. However, the result shows that none of the industry dummy variables are significantly related to the accounting measure of performance ROA using TDTA, LTDTA or STDTA as a measure of capital structure. The insignificant impact of these dummy variables indicates that a higher level of investment in these sectors may not be associated with a higher level of ROA.

The result also shows that the Engineering Technology sector has a positive and highly significant impact on the market performance measure Tobin's Q using both the TDTA and LTDTA measure of leverage. This implies that higher level of investment in this sector could yield a better market performance. It could also be a reflection of the recent wave of technology use in Nigeria which could lead to the presence of the industry sector. Table 4 further shows that the industry dummy variables for six sectors including Building sector, Construction sector, Healthcare sector, Machinery sector, Printing sector and Real Estate sector are significantly and negatively related to the market measure of performance using STDTA as a measure of capital structure. This significant negative relationship may indicate that higher level of short term debt usage by these industrial sectors may lead to lower market performance for these industry sectors. Therefore we reject the null hypothesis and conclude that industrial sector impact on market performance of Nigerian firms. However, the significance and sign of these industrial sectors changed as the performance measure changed which may imply the presence of the industry sector.

## 5. CONCLUSION

This study examines the impact of the industrial sector on performance of firms in a multicultural economy. The study combines two strands of business research: one

from the international business field on corporate performance, and the other from corporate business field on industry. The study employed descriptive econometric analytical tools in studying 101 Nigerian quoted companies with 505 observations for the period 2003 to 2007. The analyses were performed using panel data estimation.

Also, two performance measures were employed namely the return-on-asset (ROA) as accounting performance measure and Tobin's Q as a market performance measure to see the varying relationship of these measures with the industrial sector in which the firms operate. Investigating the effect of industrial sector on corporate performance using market and accounting measures was quite valuable as it provides evidence about whether the industries are efficient or not in the face of cultural diversity in a multicultural economy as Nigeria. From the empirical results, some industry sectors presence was observed. The study concludes that regardless of the diverse cultural citizenship values in Nigeria, there is presence of the industrial sector in the economy. The study therefore recommends that Nigerian firms should strive to match their high market performance with real internal activities/operations that would reflect or rub-off on their internal growth and accounting performance.

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