

IMPLICATION OF INTANGIBLE ASSETS ON FINANCIAL PERFORMANCE OF LISTED MANUFACTURING FIRMS IN NIGERIA

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Abstract

This study examined the implication of intangible assets on financial performance of listed manufacturing firms in Nigeria. This research objective is to ascertain how Goodwill (GW), Computer Software (CSW), and Investment in Research and Development (IRD) affect the return on asset of Nigerian manufacturing firms. In order to determine how intangible assets affect financial performance, the study used a panel data technique and an ex post facto research methodology. The study used fifteen manufacturing companies' audited accounts covering the years 2011–2021. Findings revealed that research and development spending (IRD), goodwill (GW), computer software (CWS) have significant relationship with ROA. Intangible assets are crucial for manufacturing organizations to measure how well their operations are running. Computer software (CSW), goodwill (GW), and investments in research and development (IRD) are examples of intangible assets that manufacturing firms should aim to increase in financial performance

Keywords: *Intangible Asset, Goodwill, Computer Software, and Investment in Research and Development, Return on Asset.*

1. Introduction

Financial performance is a gauge of the financial situation or results of management decisions of an entity. Bayaraa (2017) opined that firm performance shows the objective achievement of organizations during a period of time. Part a company's financial statements is its performance, which shows how well it used its resources to generate money during a certain time period. The term "intangible assets" describes a group of resources that are not physical but have economic value, such as a company's experience, goodwill, knowledge, intellectual property, and information. According to Zhang and Guan (2016), intangible assets significantly affect the regular operation, development, expansion, and the attainment of continuous profitability.

A company's financial position and profitability are significantly influenced by intangible assets. Companies are increasingly investing in intangible assets, which are not subject to cash flow fluctuations (Susak & Bubic, 2015). Intangible asset of an organization consists of the intangible resources used in manufacturing, which are crucial for creating and selling better products and services. Izedonme, et.al (2013) included a wide variety of intangible assets, including but not limited to designs, blueprints, patents, licenses, trademarks, and consulting services pertaining to technology. Intangible assets are critical for organizations to achieve their objectives. According to Lee (2013) intangible assets are pervasive around the world and affect many aspects of a company. In today's business world, intangible assets are key strategic resources that help create value for companies and boost their financial performance (Gamayuni, 2015).

According to Rufo (2017), firms now realize intangible asset are important for financial success, money creation, and ability to stay competitive. Nevertheless, not all companies are eager to put money into intangible assets despite the obvious financial benefits. A company's financial statements typically only detail its physical assets, ignoring any intangible assets that may exist. Ignoring intangible assets is putting too much emphasis on tangible assets and too little on the other factors that contribute to the financial performance organization. Companies that rely on expertise, such as manufacturing firms, place a high value on intangible assets when predicting their future financial performance (Haran, 2014).

The main objective of the study is to examine the implication of intangible assets on financial performance of listed manufacturing companies in Nigeria. Specifically, the study investigates impact of computer software on financial performance of listed manufacturing companies in Nigeria; investigate the impact of Goodwill on financial performance of listed manufacturing companies in Nigeria; analyze the impact of investment in research and development on financial performance of listed manufacturing companies in Nigeria.

2. Literature Review

2.1 Theoretical Review

Resource Based Theory (RBT) was developed by Barney (1991). Intangible assets are the main resources that boost firms' financial performance. Based on the theory, firms have the ability to succeed in the market and gain a competitive edge hinges on how well it can identify and quantify all of its major resources. According to Resource-Based Theory (RBT), resources that

are hard to replicate, irreplaceable, intrinsic to the business, and generate synergies are the keys to a long-term competitive advantage (Barney, 1991). Managers, then, need keen eyes for the assets and elements that really matter for their companies' success. The inputs that go into making a product are known as resources, and they can be either physical or intangible. Capital, equipment, personnel knowledge, patents, funding, and competent management are all examples of such resources. As a result, intangible assets are acknowledged as important resources. These assets are inherently valuable and work together to create a lasting competitive advantage.

2.2 Conceptual Review

Intangible Asset

Intangible assets consist of its unique and hard-to-replicate advantages. As an element of production, it is energetic to a firm ability in order to generate value and remain competitive (Nijun, 2017). Both company performance and agility are affected by intangible assets, say Appelbaum et al. (2017). Intangible assets are those that are not physical and can be identified, but do not have monetary value (IAS38). Intangible assets are those that have occurred in the past but do not have a physical representation. These are seen as potential financial benefits that the entity may reap in the future. It is classified by IAS38 as things like computer software, patents, licencing, franchise agreements, trademarks, and similar concepts. They include those that do not have a monetary value and do not have any physical form. Software on a CD, legal documents for a patent or license, or even film for a movie are all examples of tangible forms that intangible assets might take, according to Mausuri (2016).

Goodwill

The goodwill of an organization represents the net fair value of its acquired subsidiaries' identifiable assets, liabilities, and contingent liabilities at the time of acquisition, less the cost of acquiring the group, as outlined in FIRS 8. Intangible assets encompass goodwill acquired with the purchase of a company's subsidiaries (Aliyu et al., 2015). The intangible asset known as goodwill is gap between price of purchase and the amount by which the purchase consideration is greater (Haran et.al, 2014). Goodwill can be developed by a corporation, according to IAS 38, through positive customer interactions and the regular delivery of quality goods and services. A company's goodwill, however, is not audited in its financial records; it can be acquired through

consolidation and, per IAS 38, is recorded as an intangible asset in the statement of financial condition. Every year, this asset has to be evaluated to see if it could be impaired. The term "software" is used to describe the set of documents, files, and instructions that make up a computer system and allow it to carry out certain operations.

Computer software

According to Zhang and Guan (2010), Microsoft further solidifies its position as the world's leading software company by leveraging intangible assets like software copyright and trademarks to boost efficiency and performance. The software's reported value is the initial cost minus the sum of all amortization and impairment losses incurred by the group. Once the team demonstrates its will and capacity to complete the development, internally developed software becomes an asset. All costs directly related to the program's creation, including capitalized borrowing charges, are included in the capitalized cost of internally developed software. Through amortization, the expense is subsequently spread out throughout the product's useful lifespan. After deducting accrued amortization and impairment, the remaining amount is the capitalized cost, which represents the accounting value of software that was developed internally. In order for software assets to be capitalized, they must enhance the future economic advantages of the underlying assets. All other costs are documented and paid for as they come up. Rationale behind this decision is that it most closely resembles the anticipated pattern of utilizing the asset's future economic advantage. The software is designed to last for no more than five years.

Concept of Investment in Research and Development

Montresor and Vezzani (2016) state that research and development is seen as a covert method of controlling profits. This is due to the fact that other parties do not have access to clear information, and their level of transparency is unclear. At the present time, there is no reliable market assessment for R&D spending that is both widely acknowledged and standardized. This is because different accounting systems have different ways of recording R&D costs. Intangible assets must be capitalized after certain conditions are satisfied (Mnif & Znazen, 2020).

Return on Assets (ROA)

Return on Assets (ROA) is a financial metric that demonstrates the profitability of a corporation relative to its total assets. It is normally calculated as net income divided by total assets. Net income is calculated from the company's income statement or statement of comprehensive income and is the profit after taxes (Enekwe, 2012).

2.3 Empirical Review

Kimouche (2019) examined the correlation between listed Algerian companies' market valuation and the intangible assets reported in their financial statements. Research also looks into whether or not these intangible assets change the predictive capacity of accounting data, namely the book value of the business. Using Ohlson's model and Pooled regression, the method entails investigating the connections between company market values, book values, and intangible assets. From 2005 to 2018, the analysis covers all publicly traded Algerian enterprises. The stock prices were retrieved from the SGBV database, while the financial statements were taken from the COSOB database. The results imply that publicly traded Algerian companies' book values affect their market prices and help to explain their volatility. But the level of explanation is quite weak. They conclude that intangible assets are not relevant to value, do not add value, do not explain price changes for publicly traded Algerian firms

Marat and Derya (2019) examined intangible assets and their components on financial performance. A total of 1353 observations across nine years (2005–2013) in Turkey make up the final sample. The two-stage estimating methods of Ordinary Least Squares (OLS) and Heckman were used to assess the hypotheses. The total value of intangible assets positively affects the sustainable development rates and overall worth of firms. Among the three parts that make up intangible assets, computerized information and databases and economic competence had the greatest impact on firm sustainable development rates and corporate value.

Rindin (2015) analyzed the relationship between intangible assets, financial policies, financial performance, and company value of publicly traded companies in Indonesia. An Indonesian firm that went public between 2007 and 2009 had its intangible assets, financial policies, financial performance, and firm value studied using path analysis. The study empirical findings showed that the organization is significantly impacted by financial policies, financial performance, and intangible assets. Despite their little effect on fiscal policy, intangible assets have a positive and substantial effect on return on assets (ROA) and company value.

The relationship between intangible assets and cash flows in publicly traded companies in the Philippines was empirically investigated by Rufo (2017). Four hundred forty-two out of two hundred sixty-four publicly traded firms in the Philippines that disclosed intangible assets in

their financial statements from 2010 to 2013 were examined in the study. Using the ordinary least square, cross-section regression method and panel regression, results showed that intangible assets significantly affect both total cash flow (91.07%) and cash flow from investment activities (68.13%). Furthermore, intangible assets impact both operational (29.56%) and financial (6.07%) cash flows. Financial holding companies, service providers, and industrial mining and oil all had significantly different intangible asset impacts on cash flow.

Mehdi, et.al (2012) analyze the Tehran Stock Exchange's Metals industry and how intangible assets affect market value. Consequently, from 2001 to 2011, the study collected financial data of the designated test case companies. F-Limer, Hausman, and Levin Lin Chu tests, as well as the pooled/panel regression. Intangible assets have a strong positive association with market value.

Nnado and Ozouli (2016) identified the impact of total intangible assets on financial performance of industrial companies listed on the NSE in Nigeria. Secondary data collected from audited annual reports of 46 industrial companies. The use of descriptive and inferential statistics, the Prais Winsten Regression Correlated Panels Corrected Standard Errors (PCSEs) approach is used to analyze the relationship between the variables. Based on the results, it appears that EVA and IA are strongly correlated negatively. A significant inverse connection between EVA and ROA are strongly correlated with one another. Since intangible assets have a high and negative correlation with financial success as measured by EVA, the results shed light on how firms behave when it comes to diminishing the value of these assets.

Li and Wang (2024) looked at how intangible assets affected financial performance of publicly listed Hong Kong ICT companies. Return on assets (ROA) was used as proxy for profitability. Dependent variables were the costs of research and development, employee benefits, and sales training. The study used a panel data. The study employed pooled ordinary least square and random effect multiple regressions to examine the relationship between the predictor variables and return on investment (ROI). Return on assets (ROA) was found to be directly related to the independent variables, which included R&D and sales training expenditures.

3. Method

The study adopted the Ex-post facto method of research design and collect data using secondary source, the data collected were from Nigeria exchange group for eleven year i.e 2011-2021. The study population are twenty consumers’ goods firms listed on the NGX. The study purposively employed fifteen consumers’ goods firm as sampling techniques.

The model for the study is stated bellows as

$$Y = a + bx \text{-----} (1)$$

$$ROA = \alpha + \beta CSW + \beta GWL + \beta IRD + \varepsilon \text{-----} (2)$$

Where:

ROA= Return on Assets (financial performance)

CSW= Computer Software

GWL= Goodwill

IRD = Investment in research and development

Variables	Measurement
ROA	Ratio of net income to asset
CSW	Natural logarithm of software
GWL	Natural logarithm of goodwill
IRD	Logarithm of investment in R&D

Several approaches were utilized in the data analysis, such as diagnostic tests, panel regression tests, correlation tests, and descriptive tests. The Hausman test was performed to determine if the fixed effects, random effects, or pooling model was better suited to the investigation. Data was analyzed using the 9.0 edition of E-view statistical software.

4. Result and Discussion

Table 1: Descriptive statistics result

	CSW	GWL	IRD	ROA
Mean	5003.714	5858.000	4801.550	0.086757
Median	3757.000	5673.000	6502.730	0.100200
Maximum	18509.00	9792.000	7823.000	0.114200
Minimum	0.000000	0.000000	0.000000	0.000000
Std. Dev.	5778.626	2877.154	4864.189	0.037094
Skewness	1.720792	-0.744991	-0.674813	-1.752769
Kurtosis	4.512339	3.158797	4.157497	4.490116
Jarque-Bera	37.09565	5.893817	8.875830	38.08677
Probability	0.000000	0.052502	0.000000	0.000000
Sum	315234.0	369054.0	686944.0	5.465700
Sum Sq. Dev.	2.07E+09	5.13E+08	4.10E+08	0.085310
Observations	165	165	165	165

Sources: E-views output, 2024

The average ROA is 8.6% indicating manufacturing firms are not very profitable. The ROA, can take on values between 0.000000 and 0.114200. The average value of goodwill (GWL) was \$5856.00. This data raises the possibility that some Nigerian manufacturing companies inflated the value of their goodwill by taking advantage of IFRS rules. Goodwill values can be anywhere from 1,000 to 9792,000. Computer software (CSW) had a substantial impact on ROA and an average value of 5003.714 Naira. A considerable amount of the net income (profit) of Nigerian manufacturing firms goes toward the cost of computer software. There is a range of values for the program on the computer, from 0.000000 to 18509.00. The standard deviations for CSW are 5778.626, GWL is 2877.154, and ROA is 0.037094. Software and goodwill both show a rising standard deviation in their respective values. It appears that manufacturing organizations in Nigeria are seeing an increase in spending due to the installation of computer software and goodwill, which in turn is contributing to the growth in expenditure. As a result, manufacturing companies in Nigeria may see a decline in profitability.

Correlation Analysis

Table 2: Correlation Matrix

	ROA	CSW	GWL	IRD
ROA	1.0000			
CSW	0.8320	1.0000		
GWL	0.0905	0.6329	1.0000	
IRD	0.0764	0.5485	0.7583	1.0000

Sources: E-view 9.0 version, 2024

The above table 2 shows the relationship that exist between CSW and ROA of Nigerian manufacturing firms. This is supported by the exact value of the estimated coefficient, which is 0.08320. What this means is that software has a direct impact on the return on assets of Nigerian manufacturing companies. If the price of software in Nigeria were to rise, it would have a positive effect on manufacturing companies' financial performance. Manufacturing firms in Nigeria are positively correlated with goodwill (GWL), the numerical value of the coefficient estimate, 0.09055, provides further support for this. It suggests that manufacturing firms in Nigeria see an improvement in profitability when goodwill increases. Results also show that IRD and ROA are positively correlated in Nigerian manufacturing firms as shown in the estimated coefficient value of 0.7583. The result demonstrates that manufacturing companies in Nigeria can increase their return on assets by investing in R&D. That is to say, Nigerian manufacturing companies see an uptick in profits when they pour more money into R&D.

Table 3: Panel Regression Result

Series	Pooled OLS (1)	FE OLS (2)	RE OLS (3)
C	2.880425 [0.0055]	2.681530 [0.0098]	2.681530 [0.0095]
CSW	-9.904590 [0.0000]	-9.220671 [0.0000]	9.220671 [0.0000]
GWL	16.15489 [0.0000]	15.03930 [0.0000]	15.03930 [0.0000]
IRD	10.63756 [0.0000]	12.57382 [0.0000]	12.57382 [0.0000]
Observation	165	165	165
R-Squared	0.817065	0.817065	0.817065
Adj. R-Squared	0.810967	0.781885	0.810967
F-Value	133.9926 [0.0000]	23.22538 [0.0000]	133.9926 [0.0000]

Source: E-view 9.0 version, 2024

Results from pooled, fixed effect, and random effect ordinary least square (OLS) regressions are displayed in Table 3, the study merged all 165 observations. The analysis showed that the pooled regression model's R-Squared value was 0.817065. This suggests that the explanatory variables, computer software (CSW), goodwill (GWL), and investment in research and development (IRD), may account for 81.71% of the total variation in the return on assets (ROA) of selected Nigerian manufacturing. Additionally, ROA is discovered to be significantly affected by these variables at 5% level of significance

The explanatory variables computer software (CSW), goodwill (GWL), and investment in research and development (IRD) can explain for 81.71% of the total variance in return on assets (ROA). However, as shown by their respective p-values of [0.0000] and [0.0000], the explanatory factors of computer software (CSW), goodwill (GWL), and investment in research and development (IRD) significantly affected return on asset (ROA).

In order to deal with the fixed effect model's unobserved effects, the random effect regression model was employed. The random effect model shows that Computer software (CSW), goodwill (GWL), and investment in research and development (IRD) are the explanatory variables that explain 81.71% of the overall variability in return on assets (ROA). The R-Squared value is 0.817065. With p-values of 0.0000 and 0.0000, respectively, for computer software (CSW), goodwill (GWL), and investment in research and development (IRD), it was also found that all three explanatory factors significantly affect ROA.

Test of Hypotheses

The research made use of the Hausman test for the test of hypotheses.

Hypothesis One

Nigerian manufacturing firms' return on assets (ROA) appears to be inversely related to computer software (CSW). However, the alternative hypothesis is accepted which state that CSW has significant effect on ROA

Hypothesis Two

In Nigerian manufacturing firms, goodwill and ROA are clearly correlated. However, the alternative hypothesis is accepted which state that goodwill has significant effect on ROA.

Hypothesis Three

Manufacturing firms in Nigeria can directly relate their financial gains to the amount of money invested in research and development. However, the alternative hypothesis is accepted which state that research and development has significant effect on ROA.

Discussion

The study found that CSW have considerable effect on ROA of manufacturing firms in Nigeria. Also, goodwill has significant effect on manufacturing firms in Nigeria. Investment in R&D have considerable effect on manufacturing firms in Nigeria.

5. Conclusion and Recommendations

Conclusion

The remarkable success of Nigerian manufacturing companies is largely attributable to intangible assets. The study concluded that ROA of manufacturing companies' is heavily

impacted through the computer software they utilize. Manufacturing companies' goodwill significantly affects their financial performance, specifically their ROA. However, ROA for manufacturing companies are greatly affected by their investments in R&D. The study therefore concluded that intangible assets significantly affect the success of Nigerian manufacturing companies.

Recommendations

- i. To boost profitability, Nigerian manufacturing firms should endeavor to increase the value of goodwill.
- ii. Manufacturing firms should invest more in computer software to improve efficiency and performance.
- iii. Manufacturing firms should upsurge their level of research and development investment to improve their profitability.

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