# The Intangible Assets Innovation and Firm Value of Quoted Consumer Goods Manufacturing Firms in Nigeria

**Emeneka, Ogochukwu L.**
Department of Accountancy
Nnamdi Azikiwe University, Awka

**Okerekeoti, Chinedu U.**
Department of Accountancy
Nnamdi Azikiwe University, Awka

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***Abstract***
*This study examined the intangible assets and firm value of quoted consumer goods manufacturing firms in Nigeria from 2012-2020 periods. Ex Post Facto research design was adopted. Data were sourced from the annual reports and accounts of twenty sampled manufacturing firms. Regression analysis was employed via E-views 9.0 statistical software. Data analysis revealed that a significant and positive effect exists between intangible assets and firm value at 5% level of significance respectively. The study further concludes that the components of considered in this study are important variables in explaining Firm Value of quoted manufacturing firms in Nigeria. Since innovation in intangible assets has a positive correlation with firm value, the study suggested that businesses should maintain a culture of innovation for the purposes of increasing customer loyalty, trust, and sales.*

***Keywords:*** *Innovation, Intangible assets and Firm value*

## Introduction

Innovation is the process by which an invention is first put into use, and businesses need knowledge, skills, and entrepreneurial abilities to innovate. It involves the initial design and production of prototypes, as well as the improvement or refinement of the invention. Testing pilot plants and building production facilities—diffusion is the process of bringing an innovation into widespread use as more and more users adopt it. According to Espada-Chavarria, Diaz-Vega, and González-Montesino (2021), innovation is the entire process—from the conception of an idea to the production of a product and its final sale. The world is now an economic village as a result of liberalization and globalization. It is essential to have a single financial reporting system that is accepted worldwide due to the expansion of e-commerce, as well as the globalization of the business world and its supporting structures and regulations. As a result of the forces of globalization, more and more nations are opening their doors to foreign investment.

As businesses expand internationally, it becomes necessary to recognize the advantages of having financial reporting standards that are widely accepted and understood.

According to Ezechukwu & Amahalu (2016), it is now common knowledge that creativity, innovation, and inventiveness are critical to an organization's survival and success. Since innovation has the potential to have a significant impact on organizational performance, it has become a priority for many organizations. This recognition encompasses non-technological organizational, marketing, and management innovations in addition to technological ones. Innovations are seen as a driver of economic expansion and a significant influence on an organization's performance and competitive position. As a consequence of this, innovation has emerged as a top priority for not only corporate executives but also state governments and the nation as a whole. As a result of the paradigm shift in the global economic environment over the past few years, accounting standards are receiving more and more attention as a means of ensuring robust and transparent financial reporting by any corporate entity. Convergence of national accounting standards with International Financial Reporting Standards (IFRS) has received a lot of attention as the world continues to become more interconnected.

Management accountants' roles in an organization are certain to change as a result of globalization, intense competition, information technology, and regulatory changes. Computer-aided design and computer-aided manufacturing, as well as advancements in advanced manufacturing technologies, have a significant impact on businesses. Management accountants have also faced difficulties adapting modern management accounting practices like activity-based costing and balance scorecard to meet changing business needs due to market pressures. This study assesses the magnitude of relationship between intangible assets innovation and enterprise value of quoted manufacturing firms in Nigeria.

## Review of Literature

### Intangible Assets Innovation and Firm Value

Across the nations for which estimates are available, the nature of the impact of including intangible capital in the growth of accounting model is comparable. According to Weqar, Khan, Raushan, and Haque (2020), it determines both an increase in labor productivity growth and a decrease in total factor productivity (TFP) growth. Tsai, Mutuc, Zhang, and Duc, 2021).However, numerous researchers have emphasized the significance of intangible resources in the knowledge economy. According to Petkovi, Kneevi, and Pavlovi (2020), the sources of wealth creation have shifted from traditional production factors like land, capital, and labor to intangible assets. To maintain their competitiveness, businesses must effectively manage their scarce, unique, and non-substituble internal resources (Kasoga, 2020;2019) Forte, Matonti, and Nicol. As an intangible asset, intellectual capital (IC) is the capacity to transform knowledge into wealth-creating goods. It is the internal force behind corporate growth and has the power to boost businesses' internal vitality. According to Tran & Vo (2018), IC is also considered to be a significant factor in a company gaining a long-term competitive advantage and improving its financial performance (Xu & Zhang2021; Zhang, Yu, Jin, and Xu, 2021).

According to Liu, Kim, and Yoo (2019), innovation is widely regarded as one of the most

significant factors in the expansion of businesses in the modern economy. However, scholars have engaged in a heated debate regarding the most effective metrics for capturing the characteristics of intangible assets and effects due to the "elusive" and heterogeneous nature of innovation. According to Denicolai, Ramusino, & Sotti (2015), this has frequently resulted in a reliance on R&D (expenses for research and development) and/or patent-related measures. Tiwari (2021) advanced the idea that a positive effect of investing in intangibles like patents cannot be taken for granted because it is significantly influenced by the manner in which a company's patent portfolio is created, assembled, and renewed over time. This contributed to the debate.

**Firm Value**

The value of a company as a whole is measured by its firm value. It is possible to think of it as the hypothetical cost that would have to be paid in order to completely acquire a business through a going-private transaction. Firm value, in contrast to market capitalization, which only takes into account the value of the company's equity, takes into account both the size of the company's debts and its cash reserves (Eggers & Park, 2018).A company's total value is measured by its enterprise value. All ownership interests and asset claims from both debt and equity are taken into account because it looks at the market value as a whole rather than just the equity value (Allega, 2020). A company's total value is measured by firm value (FMV), which is frequently used as a more comprehensive alternative to equity market capitalization. The company's market capitalization, short-term and long-term debt, and any cash on the balance sheet are all included in EV's calculation. Van de Wetering, Kurnia, & Kotusev (2000) say that a common metric for valuing a company for a possible takeover is its enterprise value.

The formula and method for calculating EV are as follows:

MC is the value of the market; equal to the current stock price divided by the number of outstanding shares of stock Total debt is the sum of short-term and long-term debt; C is cash and cash equivalents; the company's liquid assets, but they may not include marketable securities.

**Empirical Studies**

The main theoretical and empirical literature on the connection between technological innovation and enterprise value was sorted out by Tian and Zhang (2016).The number of patents was used to measure the relationship between technology innovation and enterprise value. Empirical evidence showed that the number of patents held by U.S. high-tech companies has a positive impact on the enterprise's market value, but that the relationship between the two companies in Japan was not significant in the study of the relationship between 1989 and 1995. The study included 184 Japanese and 256 American high-tech companies. Using the Ohlson (1995) valuation model, Temiz and Güleç (2017) investigated the impact of earnings and equity book value on share prices in Turkey. In contrast to the pre-IFRS period from 2001 to 2004, the post-IFRS period from 2005 to 2008 demonstrated a change in value relevance over the same number of years. The only non-financial businesses in the study's sample were those that use the BIST index. For the periods, cross-sectional and pooled regression was used to test the value relevance. Additionally, survival analysis, or panel data analysis, was used to confirm the rise in value relevance over time. The effect of company size and earnings announcement on value relevance for robustness was also tested in the study. Value relevance has increased in terms of

explanatory power when two periods are compared, according to panel data analysis. According to Fuada, Januartib, and Ali (2017), the value relevance of accounting information in Indonesia is affected by both conditional and unconditional conservatism as well as the adoption of IFRS. The study found that the value relevance tends to increase after IFRS implementation using pooled cross sectional analysis for 429 publicly listed industrial firms between 2003 and 2014. IFRS increased the value relevance of earnings while decreasing the value relevance of book value for firms with a medium level of conservatism when the sample was grouped according to various accounting conservatism levels. However, the value relevance of earnings (book value) and conservatism were found to have a negative (positive) relationship when measured as continuous variables. An inverse U-shaped relationship between conditional conservatism and earnings value relevance and a U-shaped relationship between conditional conservatism and book value relevance were suggested by the analysis. Gonçalves, Lopes, and Craig (2017) used 389 firm-year observations from 2011 to 2013 of listed companies in 27 European nations to investigate the value relevance of fair value accounting for biological assets under IAS 41 Agriculture. Value relevance was operationalized as the capacity of book value to explain market equity value in the Ohlson (1995) model. The findings confirmed that recognized biological assets are value relevant at fair value, but that firms with higher disclosure levels are more value relevant. However, the findings suggested that investors did not value recognized biological assets in businesses with higher disclosure levels for consumable biological assets. Using information from Nigerian listed manufacturing companies' annual reports for the years 2012-2016, Ibrahim (2017) presented an empirical analysis of the factors that influence the choices made by these companies regarding their capital structures. Leverage ratio, which is calculated by dividing total debt by total assets, was measured to determine the influence of eight explanatory variables. An easy Probit Regression method was used. The most important explanatory variable is profitability, which has a negative relationship with leverage. Capital structure was positively influenced by tangibility. In addition, the study did not uncover any evidence that the sample firms' decisions regarding leverage were influenced by earning volatility. Rather, the development potential and age variable were both having positive relationship with capital design. The former is significant at 1%, whereas the latter is significant at 5%.At the 10% significant level, the relationship between the liquidity is negative. The natural log of net total assets, which measures size, has a positive coefficient and is significant at l percent. Yousefinejad, Ahmad, Salleh, and Rahim (2018) looked into the connection between ASEAN countries' FDI inflows from 2001 to 2016 and the adoption of the International Financial Reporting Standard (IFRS).The short-term, long-term, and causal relationship between variables were examined using panel co-integration and the causality test in this study. Model 1 used a dummy variable to measure IFRS adoption, while Model 2 used a level of IFRS compliance. The Dynamic Ordinary Least Square (DOLS) estimation analysis revealed a positive and significant relationship between IFRS adoption based on both measures and FDI inflows. The study's findings confirmed the existence of co-integration between variables. In addition, the causality test demonstrated both short-term and long-term causality between variables and IFRS inflows. Almaharmeh and Deh (2018) looked at how the London Stock Exchange-listed companies' accounting earnings improved as a result of mandatory IFRS adoption. The findings from analyzing 9056 firm-year observations from 1994 to 2013 suggested that the mandatory adoption of IFRS results in improved earnings quality. The study tested the

predictions regarding the impact of mandatory IFRS adoption on earnings quality with a fixed effect design. All of the companies that are listed on the London Stock Exchange and have access to data in the DataStream, World scope, and IBES international databases for the time period of 1994 to 31 December 2013 comprised the research sample. The purpose of Nurfitriana (2018) was to ascertain how company characteristics, auditor quality, and IFRS convergence affected financial reporting timeliness. Companies that are a part of Indonesia Stock Exchange's main sector served as the study's populations. The primary industry that was listed on the Indonesia Stock Exchange in 2016 comprised the population of the study. There were 48 businesses in the chosen sample, which was selected using a random sampling method. Regression analysis was used to test the research hypothesis. The study's findings demonstrated a positive correlation between financial reporting timeliness and IFRS convergence; Leverage has a negative impact on the timeliness of financial reporting, and the quality of auditors has a positive impact on the timeliness of financial reporting. Firm size has a positive impact on the timeliness of financial reporting. Using longitudinal data, Juniarti, Ferbiana, Novitasari, and Tjamdinata (2018) compared the value relevance of accounting information before and after IFRS adoption in Indonesia. The goal of the study was to address the need to improve adopters' compliance with the standard. Using a modified Ohlson Model (1995), this study compared the value relevance of accounting information four years prior to passage (2007-2010) and four years after adoption (2011-2014).This study demonstrates, employing longitudinal data from manufacturing companies listed on the Indonesia Stock Exchange (IDX), that accounting information has a greater value relevance after IFRS adoption than before. The Pooled Least Square and Random effect models were used in the robust result. The findings successfully demonstrate an increase in value relevance following IFRS adoption. Management innovation and technological innovation were examined by Zhang, Khan, Lee, and Salik (2019), with sustainability serving as a mediator. A sum of 700 associations were haphazardly chosen and 700 surveys were disseminated among the associations (just a single poll for every association).Because top managers, such as CEOs, are more familiar with the policies and plans of their organizations; they were required to complete the survey for the study. On the empirical data gathered from 304 Pakistani CEOs and top managers, structural equation modeling was used in the analysis of moment structures (AMOS) to test the model. According to the findings, technological innovation and management innovation have a significant positive impact on the sustainability of an organization and its performance. Sustainability serves as a partial intermediary between technological innovation and organization performance as well as between management innovation and organizational performance. Odoemelam, Okafor, and Ofoegbu (2019) investigated how the adoption of IFRS affected the relevance of quoted Nigerian businesses' earnings values. Earnings value relevance was examined with a sample of 101 firms (or 1212 firms over the course of the study) that was quoted prior to 2006 and adopted IFRS between 2006 and 2017.The Fixed Effect Model served as the appropriate estimator for data analysis in the study. The cross-product term's estimated coefficient is positive and statistically significant. The findings suggested that Nigeria's adoption of IFRS resulted in a greater relevance of earnings values. Kaushalya and Kehelwalatenna (2020) investigated how the adoption of IFRS affected the value relevance of accounting information. Panel data regression models were estimated using publicly available data from annual financial statements and Colombo Stock Exchange (CSE) reports for all CSE-listed companies from 2008 to 2018.The

study found that since Sri Lankan companies adopted IFRS in 2012, price value relevance has increased and return value relevance has decreased. It also revealed that, following the adoption of IFRS, the value relevance of earnings has decreased, while the value relevance of operating cash flows has not changed. This is similar to the findings of previous studies on IFRS, which show that investors place a greater emphasis on the company's book value rather than its earnings when making decisions. Kijkasiwat and Phuensane (2020) investigated the moderating effect of firm size on the relationship between innovation and firm performance among small and medium-sized businesses in 29 countries in Central Asia and Eastern Europe. Financial capital was also looked into to see if it affected the impact of product and process innovation on company performance. Samples of businesses from 29 countries in Central Asia and Eastern Europe served as the basis for the analysis.12,890 SMEs with 5–99 employees served as samples in the study. The World Bank and the European Bank for Reconstruction and Development used BEEPS 2013 to compile the data. There were several sections in the survey, including finance and innovation. Companies in various industries and regions were surveyed using the stratified random sampling method. Partially least square structural equation modeling was the approach that was taken. According to the findings, the positive or negative impact of innovation on firm performance is moderated or mediated by firm size and financial capital. By highlighting the significance of firm size and financial sources when planning to introduce innovations to enhance firm performance, the findings have implications for decision makers.

This study, in contrast to other studies that primarily focused on IFRS adoption, closed the variable gap in the literature by considering innovation in IFRS adoption. The Heteroscedasticity test, which was not used in previous studies, was used to close the methodological gap.In addition, this study's extension to 2020, in contrast to previous studies that ended in 2019, closed the periodic gap. Additionally, in contrast to previous studies that used a random sampling method (to the best knowledge of the researcher), this study bridged the sectorial gap by taking into account the entire manufacturing sector.

**Methodology**

The research designs employed in this study is *ex-post facto* research design. *Ex-post facto* research design was employed order to establish the meaningful relationship between environmental cost disclosure and productivity. Purposive sampling technique was adopted to select the sample of twenty four (20) consumer goods manufacturing firms with up to date and complete annual reports and accounts for the studied period (2012-2020)

Primarily, this study made use of secondary data. The data were sourced from annual report and accounts of the sample firms, particularly the comprehensive income statement and statement of financial positions of these companies as well as their respective notes to the accounts.

**Model Specification**

$Y = X$

Where

Y = Firm value

$X_1$ = Intangible assets

$\beta_o$ = Regression Weights Coefficients

$Y = \beta_o + \beta_1 X_1 + \mu$

Where:

Y = Firm value (dependent variable)
X = Intangible assets (independent Variable)
$\beta_0$ = constant term (intercept)
$\beta_1$ = Coefficients of job performance
$\mu$ = Error term (stochastic term)

The following research models were formulated in line with the research hypotheses in order to empirically determine the relationship between Intangible assets and Firm Value:

$FMV_{it} = \beta_0 + \beta_1 INA_{it} + \mu_{it}$ - - - - - **i**

**Where:**
$FMV_{it}$ = Firm Value of firm í in period t
$INA_{it}$ = Intangible Assets Innovation of firm í in period t
í= firm identifier
t= time variable

**Method of Data Analysis**

Descriptive statistics was used to describe the mean, median, standard deviation, kurtosis, skewness, maximum and minimum values of the study and regression analysis via E-Views 9.0 statistical software.

**Decision Rule**

Accept the null hypothesis, if the P-value of the test is greater than 0.05. Otherwise reject and accept $H_1$.

**Data Analysis**

**Table .1 Descriptive Statistics**

| | FMV | INA |
|---|---|---|
| Mean | 2.226667 | 0.477778 |
| Median | 1.800000 | 0.470000 |
| Maximum | 3.540000 | 0.620000 |
| Minimum | 1.420000 | 0.290000 |
| Std. Dev. | 0.995942 | 0.096925 |
| Skewness | 0.640117 | -0.401708 |
| Kurtosis | 1.494967 | 2.864792 |
| Jarque-Bera | 1.464047 | 0.248909 |
| Probability | 0.480935 | 0.882978 |
| Sum | 20.04000 | 4.300000 |
| Sum Sq. Dev. | 7.935200 | 0.075156 |
| Observations | 9 | 9 |

Source: E-Views 9.0

**Interpretation**

The descriptive statistics for both the Firm Value index (FMV) and the Innovation indices (INA) are presented in Table 1.The outcome demonstrates that 216 individuals observed the study, or 24 businesses divided by 9 years. The consistency of the CVA earned by the companies under consideration is demonstrated by the fact that the mean FMV is 2.226667 and the variability is

0.996.The FMV has a maximum value of 3.540000 and a minimum value of 1.420000.The fact that the average value of intangible assets was 0.477778 indicates that the sample firms reported approximately 47.78 percent of the information on innovation in intangible assets. According to the financial statements, intangible assets had a maximum level of 62% and a minimum level of 29%.Nevertheless, there are a few small variations in the values, with a standard deviation of 0.097.

**Test of Hypothesis**

**$Ho_1$:** intangible assets innovation has no significant effect on firm value of quoted consumer goods manufacturing firms in Nigeria.

**Table 2 Regression analysis between INT and FMV**

Dependent Variable: FMV
Method: Least Squares
Date: 11/13/22 Time: 11:41
Sample: 2012 2020
Included observations: 9

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | -1.837694 | 1.059658 | -1.734233 | 0.1265 |
| INA | 8.506801 | 2.178401 | 3.905066 | 0.0059 |

| | | | |
|---|---|---|---|
| R-squared | 0.685387 | Mean dependent var | 2.226667 |
| Adjusted R-squared | 0.640442 | S.D. dependent var | 0.995942 |
| S.E. of regression | 0.597198 | Akaike info criterion | 1.999994 |
| Sum squared resid | 2.496519 | Schwarz criterion | 2.043822 |
| Log likelihood | -6.999974 | Hannan-Quinn criter. | 1.905414 |
| F-statistic | 15.24954 | Durbin-Watson stat | 1.984394 |
| Prob(F-statistic) | 0.005861 | | |

**Interpretation of Regression Results**

In Table 2, R-squared and adjusted Squared values were (0.69) and (0.64) respectively. The indicates that all the independent variables jointly explain about 64% of the systematic variations in firm value of our samples firms over the nine years periods (2012-2020). Table 2 reveals an adjusted $R^2$ value of 0.64. The adjusted $R^2$, which represents the coefficient of multiple determinations imply that 64% of the total variation in the dependent variable, firm value (FMV) of quoted consumer goods manufacturing firms in Nigeria is jointly explained by the explanatory variable, intangible assets (INT). The adjusted $R^2$ of 64% did not constitute a problem to the study because the F- statistics value of 15.24954 with an associated Prob.>F = 0.0058 indicates that the model is fit to explain the relationship expressed in the study model and further suggests that the explanatory variables are properly selected, combined and used. The value of adjusted $R^2$ of 64% also shows that 36% of the variation in the dependent variable is explained by other factors not captured in the study model. This suggests that apart from INA, there are other factors

that mitigate firm value of quoted consumer goods manufacturing firms in Nigeria.
Using Durbin-Waston (DW) statistics which we obtained from our regression result in table 2, it is observed that DW statistics is 1.984394 and an Akika Info Criterion and Schwarz Criterion which are 1.999994 and 2.043822 respectively also further confirms that our model is well specified.
The null hypothesis is rejected since Prob (F-statistic) at 0.0059 is less than the critical value of 5% (0.05). This implies that intangible assets have a significant and positive effect on firm value of quoted consumer goods manufacturing firms in Nigeria at 5% level of significance.

**Conclusion and Recommendations**

The intangible assets and firm value of Nigeria's quoted consumer goods manufacturing companies from 2012 to 2020 were the focus of this study. Information were obtained from the yearly reports and records of twenty inspected fabricating firms. Statistical software called E-views 9.0 was used to perform regression analysis. At the 5% level of significance, data analysis revealed that intangible assets and firm value have a positive and significant relationship. As a consequence of this, the growing body of evidence suggests that innovation in intangible assets has a significant relationship with firm value at a significant level of 5%.The study also comes to the conclusion that the variables taken into account in this study are important in explaining Firm Value of Nigerian quoted manufacturing firms. Since innovation in intangible assets has a positive correlation with firm value, the study suggested that businesses should maintain a culture of innovation for the purposes of increasing customer loyalty, trust, and sales.

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