RESEARCH ARTICLE

Relationship Between Intangible Assets and Value of Oil and Gas Firms in Nigeria

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The main objective of the study is to evaluate relationship between intangible assets and value of oil and gas firms in Nigeria. The specific objectives of the study are to, analyze the relationship between goodwill and net assets of oil and gas firms in Nigeria. Examine the relationship between software and net assets of oil and gas firms in Nigeria. Ascertain the relationship between brands/trademarks and net assets value of oil and gas firms in Nigeria. A sample of five (5) oil and gas firms listed on Nigeria Stock Exchange during the period of 2011 to 2020 were selected for the study. Panel data were collected from the published annual accounts and financial statements of the selected firms while correlation analysis was used to analyze the data. Findings from the study suggest that the three independent variables of the study (goodwill, computer software and brands/trademarks) positively and strongly relate with net assets of the listed oil and gas firms during the period. The study recommended that oil and gas firms in Nigeria should develop business policies that will increase the goodwill of their firms. Some of the policies include lactation of production and business facilities in strategic places for easy access and marketing, good customer service for customer retention among others. It was also recommended that oil and gas firms in Nigeria should invest in modern computer software that will assist them in oil and gas exploration, mining and production. It will also assist the firms in the marketing and distribution of oil and gas. Finally, it was recommended that the firms should strive to develop strong brands and trademarks that will distinguish their products from the competitors' products. This will among others assist the firms checkmate fake and adulterated products which are rampant in the Nigeria economy.

ABSTRACT

Keywords: *Intangible Assets; Oil and Gas Firms; Nigeria; Net Assets Value; Goodwill*

Introduction

Business activities have in the last few decades progressively moved into a knowledge-based, fast-changing and intensive technology drive economy in which investments in human resources, information technology, research and development and other intangible assets have become essential in order to maintain firm competitive position and ensure its future viability (Leandro; García-Ayuso & Sánchez, 2000). Therefore, the source of economic value and wealth is no longer the production of material goods but the creation and manipulation of intangible assets. Firms feel a growing need to make investments in intangibles on which the future success of the firm is based, however, in most cases these investments are not reflected in the statement of financial position due to the existence of very restrictive accounting policies for the recognition of assets and their valuation (Okoye; Offor & Manukaji, 2019).

IFRS 3 and IFRS 38 simply define intangible assets as identifiable, non-monetary assets without physical substance which are expected to generate economic returns for the firm in the future. The three critical attributes of an intangible asset according to the IFRS 3 are, identifiability, control and future economic benefits. Osinski; Selig; Matos & Roman (2017) describes intangible assets as assets that do not have a specific physical form, such as a firm's reputation, culture and value, brand name, technology, and so on, but can make a significant contribution to creating business value. Zambon (2003) states that intangible assets lack physical existence and do not have a financial embodiment and its valuation is difficult and uncertain. Intangible assets usually relate to innovations implementation, technology development or marketing activities. Their importance in different firms varies, however it is proved that intangible assets in combination with other tangible assets are among the main drivers of competitive advantage and corporate profit.

Emmanouil & Dimitrios (2017) states that what differentiates businesses in modern time is the intangible property, rather than material assets. Thus, neither the low cost of raw materials nor the mere possession of plant, machinery, transport equipment, raw materials and goods is sufficient to ensure continued business growth and firm profitability. It is only a well-established brand, know-how, or other intangible assets that can guarantee business profitability, continuity and growth. Lev (2001) also asserts that intangible assets are major drivers of firm growth and value in most economic sector as the book to market ratio can forecast return because this ratio is a good proxy for intangible asset. Garger (2010) states that the value of intangible assets is more volatile than the value of tangible assets and these changes increase the difference between a firm's book value to its market value.

Andrews & De-Serres (2012) identified many types of intangible assets such as patents, copyright, trademarks, design, mineral exploration, brand, software, formula, trade secrets, capitalized research and development, goodwill, databases, domain, human capital, motion pictures, consumer lists, customer loyalty, licenses, market share, and marketing rights. Also, Vezzani (2016) used research and development expenses, software, design, training, reputation/ branding, and organizational/ business processes in his study of the links between intangibles investment and innovation in European firms. In Hong Kong, Li & Wang (2014) used research and development cost, employee benefit expense and training expense to proxy intangible assets in their study of the influence of intangible assets on profitability of publicly listed firms in the information and communication technology sector. In Nigeria, Awa, Okwo & Obinabo (2020) also adopted goodwill and computer software in their study of the effect of intangible assets on corporate performance of selected commercial banks in Nigeria. This study, however, adopted goodwill, computer software and brands/trademarks as intangible assets and assessed their relationship with firm value in of oil and gas firms in Nigeria.

Statement of the Problem

Business have recognized the importance of intangible assets in improving their financial performance, creating value and maintaining competitiveness. It also provides a firm with its identity and assets assist a firm in new customers' acquisition and increase customer satisfaction. It provides firms with the ability to leverage on the opportunities present in the market and also promotes future capacity for the growth and sustainability. Consumer perception and reputation of a firm in the market are the core elements for the success of any firm.

In Nigeria, a number of corporate entities, particularly, oil and gas firms have remained indifferent about investing on intangible assets and recognizing their economic benefits. Most of the assets recorded in financial statement of the firms are the tangible asset, thereby overlooking the intangible assets. With the absence of recognition of intangible assets, some important factors to firm's potential return are neglected while tangible assets effects are over emphasized. This development leads to weak competition in the market place, poor return on assets and low firm value. Some oil and gas firms in the country has died off and exited the market as a result of poor performance. This prompted the current study to evaluate intangible assets and value of oil and gas firms in Nigeria**.**

Objectives of the study

The primary objective of the study is to evaluate the relationship between intangible assets and value of oil and gas firms in Nigeria**.** The specific objectives are to;

I. analyze the relationship between goodwill and net assets of oil and gas firms in Nigeria.
II. examine the relationship between software and net assets of oil and gas firms in Nigeria.
III. ascertain the relationship between brands/trademarks and net assets value of oil and gas firms in Nigeria.

Research Questions

The following research questions are in line with the specific objectives of the study;

I. How does goodwill relate with net asset of oil and gas firms in Nigeria?
II. To what extent does software relate with net asset of oil and gas firms in Nigeria?
III. What is the relationship between brands trademarks and net assets of oil and gas firms in Nigeria?

Statement of the Hypotheses

The following null hypotheses were formulated to address the research questions of the study;

I. Goodwill does not positively and strongly relate with net asset of oil and gas firms in Nigeria.
II. Software does not positively and strongly relate with net asset of oil and gas firms in Nigeria.
III. Brands/trademarks does not positively and strongly relate with net asset of oil and gas firms in Nigeria.

Review of Related Literature
Conceptual Review
Intangible Assets

Gamayuni (2015) describes intangible assets as the sum of what is produced by the three main elements of a firm, that is, human capital, structural capital and costumer/relational capital which are related to knowledge and technology that can deliver more value to the firm in form of organizational competitive advantage. Casey (2017) also describes intangible assets as those assets that cannot be measured, but still have value, such as a strong brand or name recognition. Villalonga (2004) opines that firms now invest more in intangible assets than in tangible assets because intangible assets play an effective role in sustaining a firm's competitive advantage due to not being easy to imitate and being an important determinant of firm internalization. Van-Ark; Hao; Corrado & Hulten (2009) states that intangible assets such as software and research are critical investments that sustain a firm's market presence in future years by reducing costs and increasing profits, and intangibles are strategic investments for the long-run growth path of firms.

Boulerne, Sahut & Teulon (2019) state that intangible assets are governed by IAS 38 and International Reporting Standard (IFRS 3). In view of this, most investors have fully understood the advantage of capitalizing intangible assets with IFRS, rather than recording them as expenditures, which is a principle of the Generally Accepted Accounting Principal system. The IAS 38 defines an intangible asset as "an identifiable non-monetary asset without physical substance. An asset is identifiable as an intangible asset when it is separable, or if it arises from a contractual or other legal right, regardless of whether these rights are transferable or separable from the entity or from other rights and obligations. IFRS 3 imposes the reporting of all intangible expenditure as intangible assets if, and only if, (a) it is probable that future economic benefits attributable to the asset will flow to the entity and (b) the cost of this asset can be measured reliably.

Goodwill

Godfreys (2021) defines goodwill as an intangible asset that arises whenever a buyer acquires an existing business entity at a price higher than the fair value. When a business is acquired, it is common for the buyer to pay more than the market value of the business' identifiable assets and liabilities. The amount that is paid in excess is known as goodwill. It accounts for the existing company's name, customer base, brand identity, employee relations and proprietary technology.

Pariente & Lopez (2018) states that goodwill does not include identifiable assets that are capable of being separated or divided from the entity and sold, transferred, licensed, rented, or exchanged, either individually or together with a related contract, identifiable asset, or liability regardless of whether the entity intends to do so. Boulerne; Sahut & Teulon (2019) assert that goodwill generated in-house is not capitalized due to the fact that costs incurred during its creation are not, in practice, identifiable from regular expenses or those which are needed to maintain its value.

Godfreys (2021) also states that goodwill is usually associated with business acquisitions which is represents the non-physical assets, such as the value created by a solid customer base, brand recognition or excellence of management. It is recorded when the purchase price is greater than the combination of the fair value of identifiable assets and liabilities. Pariente & Lopez (2018) states that in spite of being inherent to a firm, the accounting value of goodwill can only be determined by a business combination.

Computer Software

Rosencrance (2021) describes software as a set of instructions, data or programs used to operate computers and execute specific tasks. It is the opposite of hardware, which describes the physical aspects of a computer. Software is a generic term used to refer to applications, scripts and programs that run on a device such as PCs, mobile phones, tablets, and other smart devices.. It can be thought of as the variable part of a computer, while hardware is the invariable part. Branden (2021) states that software tells a computer how to function. Software contrasts with hardware, which is the physical aspects of a computer that perform the work. Without software, most computers would be useless. Nagar (2017) states that computer software directs all of the peripheral devices on the computer system on what exactly to do and how exactly to perform a task. A software plays a key role of a mediator between the user and the computer hardware. In the absence of software, a user essentially can't perform any task on a computer.

Rosencrance (2021) identifies two main categories of software as application software and system software. An application software is a software that fulfills a specific need or performs tasks. System software is designed to run a computer's hardware and provides a platform for smooth running of applications software. Branden (2021) states that an operating system is a software program that serves as the interface between other applications and the hardware on a computer or mobile device. TCP/IP is built into all major operating systems to allow computers to communicate over long distance networks. Without the operating system or the protocols built into it, it wouldn't be possible to access a web browser.

Brands and Trademarks

Marion (2015) defines a brand as a name, term, design, symbol, or any other feature that identifies one seller's good or service as distinct from those of other sellers. You can consider a brand as the idea or image people have in mind when thinking about specific products, services, and activities of a firm, both in a practical and emotional way. A product can be easily copied by other players in a market, but a brand will always be unique. Brown (2021) also describes a brand as an intangible marketing concept that helps people identify a particular firm, product, or individual. Brands help shape people's perceptions of firms, their products, or individuals. They are commonly used by markers to create brand identities within the marketplace. They provide enormous value to a firm or individual, giving them a competitive edge over others in the same industry. As such, many entities seek legal protection for their brands by obtaining trademarks. Coleman (2021) states that a brand differentiates a product from similar other products and enables it to charge a higher premium, in return for a clear identity and greater faith in its function. A brand is also likely to survive longer than just an undifferentiated product. It is akin to a living being that has an identity and personality, name, culture, vision, emotion and intelligence. All these are conferred by the owner of the brand and needs to be continuously looked at to keep the brand relevant to the target market.

Tardi (2021) defines a trademark as an easily recognizable symbol, phrase, or word that denotes a specific product and which legally differentiates a product or service from all others of its kind and recognizes the source firm's ownership of the brand. A trademark exclusively identifies a product as belonging to a specific firm and recognizes the firm's ownership of the brand. Trademarks are generally considered a form of intellectual property and may or may not be registered. Trademarks may or may not be registered and are denoted by the ® and ™ symbols respectively. Even though trademark does not expire, the owner must make regular use of it in order to receive the protections associated with them.

Net Assets

Christiawan & Tarin (2004) describe net asset value of a firms as the difference between the value of the assets and liabilities of a firm which is often called 'net assets or shareholders' fund. As the name implies, net assets or book value of a firm is its value as reflected in its books or statement of financial position. The book value is the true worth of business when its liabilities are netted off from its assets. O'Sullivan & Steven (2003) state that net assets per share is obtained by dividing the net assets value of a firm by the total number of the firm's shares outstanding. Asset value of a firm can be taken as the value of the firm, and firms with larger net asset value are considered to be better positioned to make profits by utilizing the strength of assets held.

Farkoosh, Farkoosh & Naseri (2012) states that net assets value of a firm differs from its market value and that the origin of this discrepancy between the historic cost and current market value related to Generally Accepted Accounting Standards which requires that the assets, liabilities and net worth values of a firm be recorded using the historic costs value rather than the current market. This implies that the calculated net asset value amount will not reflect the true value of the shareholder's equity or net assets value. Thus, in order to calculate the exact value of net assets, it will be necessary to ascertain the current market value of assets of the firm.

Theoretical Review

This is anchored on Efficient Market Theory developed by Malkiel & Fama in1970

Efficient Market Theory

The Efficient Market Hypothesis was developed by Malkiel & Fama in1970. Malkiel & Fama (970 argue that stock prices reflect all available information of the stock, and price valuation varies if investors have new data about the expected future cash flow of a firm. The efficient market would provide accurate signals for resource allocation, as market prices are a representative of each stock intrinsic worth. Malkiel and Fama (1970) classified market efficiency into three forms: (i) weak form, which is based on information on historical data, (ii) semi-strong form is based on the information of public data, and (iii) strong from is based on private information (or insider information). Since the information on intangible assets is not reported in public financial statements, all intangible assets internally generated are considered as private information. Specifically, intangible assets are reflected in the financial statements of a firm only if they are acquired assets and assets with identifiable value and useful lifespan, which is,

therefore, can be amortized. Internally developed intangible assets re not registered in the financial statements. This is because these assets were developed internally and have no price. The theory of an efficient market hypothesis is relevant for this study, since it helps to explain that the increase in stock prices is a result of the growth of intangible assets.

Empirical Review

Awa, Okwo & Obinabo (2020) adopted ex post facto research design to examine the effect of intangible assets on corporate performance of selected commercial banks in Nigeria from 2012 to 2018. The independent variables of the study and measures of intangible assets are goodwill and computer software while the dependent variable and measure of corporate performance is return on assets. Secondary data were obtained from the annual reports and financial statements of the selected banks and analyzed using descriptive statistics, correlation analysis and panel data regression analysis. Results of the analysis suggest that goodwill and computer software which had statistically significant effect on the return on assets. This implies that commercial banks rely on intangible assets in accessing the performance of the banks. The study recommended that banks should make intangible assets more productive by paying attention to Good and Computer Software.

Zaroug & Mawih (2020) examine the effect of intangible assets, financial performance and financial policy on the firm value of Omani industrial firms listed in the Muscat Securities Exchange from 2010 to 2014. A sample of 46 industrial firms was selected from the Muscat Securities Exchange during the period. Three classes of independent variables are used, namely, intangible assets, financial policy and financial performance. Tobin's Q ratio is used as the dependent variable and measure of firm value. Financial policy is measured by debt and dividend policies, and financial performance is measured by profitability, liquidity and assets turnover. Findings indicate that intangible assets, financial policies and financial performance have a significant influence on firm value.

Qureshi & Siddiqu (2020) analyzed the degree to which intangible assets effect financial performance, financial policies and market value of the technology firm in 14 Countries from Different Continents from 2015 to 2018. A total of 80 firms according to the market capitalization of their respective countries in the technology sector globally were sampled for the study. The variables of the study, profitability efficiency, capital structure, dividend policy and market value were calculated through the proxies return on assets, return on equity, return on investment, net profit margin, debt to equity ratio, dividend payout ratio, price-earnings ratio, price to sales and price to book value. Structural equation modeling analysis was used to ascertain the relationship among intangible assets, firm performance, firm policies, and market value during the period. Overall results from the multi regression analysis indicates that the higher the intangible assets owned by a firm, the higher firm's ability to generate profits.

Ferdaous & Rahman (2019) examined the relationship between intangible assets and firm performance of manufacturing firms in Bangladesh during the period of 2007 to 2017. A sample of 49 manufacturing firms listed in Bangladesh during the period was selected for the study. Secondary data were collected from the selected firms and analyzed using panel data, fixed effect regression model. Results from the analysis reveals mixed behavioral effects of intangible assets on firm performance. This implies that even if intangible assets trigger a significant rise in the firms' earnings per share, the firms cannot maximize shareholders' wealth due to their poor performance in the stock market of Bangladesh.

Okoye, Offor & Manukaji (2019) examined the effect of intangible assets on performance of quoted companies in Nigeria from 2008 to 2017. Five (5) firms from different sectors of the economy were sampled. The economic sectors are: Financial sector (First Bank of Nigeria Plc); Consumer goods sector (Nestle Nigeria Plc); Oil and gas sector (Total Nigeria Plc); Industrial goods sector (Nigerian Wire and Cable Plc) and Health sector (May and Baker Nigeria Plc). Employee benefit expenses, research and development cost and goodwill were employed as the independent variable while return on capital employed was employed as the dependent variable. Ex post facto research design was employed. Descriptive statistics, correlation analysis and ordinary least square regression were used to analyze the secondary data obtained for the study. Results suggest that employee benefit expenses have no significant effect on return on capital employed. Research and development cost has a significant effect on return on capital employed while goodwill has a significant effect on return on capital employed. It was concluded that intangible assets have significant effect on performance of listed firms in Nigeria. It was recommended that management should have

positive disposition towards intangible assets disclosure in order to project the real value of intangible assets in their organization.

Kamath (2015) assessed the effect of intellectual capital on financial performance and market valuation of firms in India from 2012 to 2013. Thirty firms from S&P BSE SENSEX record which comprises of 30 firms from crosswise over different assembling and administration segments were chosen for the investigation. Various straight Regression examination was utilized to think about the effect of IC on financial performance and market value of these select firms. The paper utilizes the VAICTM system to assess the information and finds that the financial performance and market value is for sure impacted by the IC of the organizations. This outcome is significant for company's administration and approach creators to make IC exposure and announcing mandatory in firms bookkeeping proclamations as the partner can get the genuine image of the genuine value of the firm.

Chiarello, Pletsch, Da-Silva and Da-Silva (2014) led an examination to evaluate financial performance, intangible assets and value creation in Brazilian and Chilean Information Technology Companies from 2018 to 2012. Nine firms were tested for the examination, five Brazilian and four Chilean, in the years 2018 to 2012. Intangible assets exposure, even with late commitment, has conveyed advantages to organizations' value and financial performance help. Expressive investigation through both narrative research and quantitative methodology was utilized. Enlightening insights investigation, t-test and Pearson's connection affirmed that Chilean organizations uncover more intangible assets and make more prominent value through achieving great outcomes in financial performance. Along these lines, the higher the financial performance, the more noteworthy the value creation, and the more prominent the intangible assets divulgence inside Chilean data technology organizations.

Nezhad, Yamrali and Aboujafari (2014) led an examination to learn the effect of intellectual capital on return of settled assets and firms' aggregate assets profit of firms recorded for the Tehran Stock Exchange from 2018 to 2012. An example of 41 firms were chosen from firms recorded on the stock trade. Auxiliary information was gathered from financial articulations of the chose firms and dissected utilizing relapse examination. Discovering demonstrates that intellectual capital has effect on return of a company's aggregate resource (financial performance) in the interim it doesn't have any impact on settled resource's arrival. The discoveries of this examination are essential since it guarantees that company's value doesn't comprise of simply substantial assets and as indicated by science advance the job of intangible assets in expanding association's value turns out to be considerably more imperative than unmistakable assets.

Kamath (2018) considered value included by intellectual capital (VAIC) to firms in medication and pharmaceuticals recorded in India stock trade for a long time (1996 to 2006). An example of best 25 firms in the medication and pharmaceutical industry in India were chosen for the investigation. Relapse examination was utilized to quantify the effect on benefit, efficiency on market value of the recorded pharmaceutical firms in India. Discovering demonstrates that human capital has effect on intellectual capital (IC), however other segments and generally IC neglected to demonstrate any noteworthy experimental effect.

Mazzucato and Tancioni (2017) surveyed stock value unpredictability and patent reference elements in the UK. They particularly needed to set up whether there is without a doubt a positive connection between firm particular instability and firm level development in biotechnological and pharmaceutical ventures. The investigation utilized firm level R and D and patent information for the examination. The investigation discovered that both the level and instability of stock prices is in certainty identified with advancement. Specifically, the positive connection among's development and particular hazard furnishes us with essential bits of knowledge on how changes in the genuine structure of generation influence stock value unpredictability, past normal clarifications identified with silly extravagance and „animal spirits. The examination discovered that instability is higher on account of little firms and in the post 1985 period, described by a more guided pursuit administration because of logical and authoritative changes. The higher instability in the last time frame is undoubtedly identified with the way that this period is portrayed by a swelling of licenses which decreases their unwavering quality as a „signal" of genuine development subsequently more slip-ups made by investors.

Tan, Plowman and Hancock, (2017) conducted a study to analyze the connection between intellectual capital and financial performance of 150 firms somewhere in the range of 2000 and 2012 in Singapore Stock Exchange. Relationship investigation was embraced in testing the hypotheses defined for the examination. The outcomes were astounding in a few sections. Counting intellectual capital and financial performance of firms are decidedly associated definitively. Future performance and development and also intellectual capital and intellectual capital were decidedly connected with firm performance. Then again, the commitment of intellectual capital on firm performance differed enterprises.

Methodology

The study adopted *ex post facto* research design. This means that the data used to conduct the study are secondary data which were collected from the annual reports and financial statements of the selected oil and gas firms listed on the Nigeria Stock Exchange during the period of 2011 to 2020. The study was conducted in Nigeria and precisely on oil and gas firms. The data source for the study were secondary data obtained from the annual reports and financial statement of the selected breweries oil and gas firms listed on the Nigeria Stock Exchange during the period. The population of this study consists of all companies under the Oil and Gas industry of Nigeria that are listed on Nigeria Stock Market. They are thirty-one (31) oil companies in Nigeria. The sample size of this study consisted of five (5) selected firms in the Oil and Gas industry in Nigeria. The sample size was ascertained using judgmental sampling method. They are Oando Nigeria Plc, Mobil Plc, Capital Oil Plc, Gas Link Plc and African Petrol. These five firms were selected based on the fact that the data for the five firms were all available for the duration of years under study.

Model Specification

The following model was developed in line with the variables of the study:

$$r = [1/(n-1)] \times \sum [((GDW - \overline{GDW})/S_{GDW}) \times ((NETA - \overline{NETA})/S_{NETA})] \ldots\ldots\ldots (1)$$

$$r = [1/(n-1)] \times \sum [((CSW - \overline{CSW})/S_{CSW}) \times ((NETA - \overline{NETA})/S_{NETA})] \ldots \ldots\ldots (2)$$

$$r = [1/(n-1)] \times \sum [((BTM - \overline{BTM})/S_{BTM}) \times ((NETA - \overline{NETA})/S_{NETA})] \ldots\ldots\ldots\ldots (3)$$

Where:

$NETA$ = the value of net assets per share

$\overline{NETA}$ = the sample mean of net assets value per share

S_{EPS} = the sample standard deviation of the earnings per share

GDW = the value of goodwill

$\overline{GDW}$ = the sample mean of the goodwill

S_{GDW} = the sample standard deviation of goodwill

CSW = the value of computer software

$\overline{CSW}$ = the sample mean of computer software

S_{CSW} = the sample standard deviation of computer software

BTM = the value of brands/trademarks

$\overline{BTM}$ = the sample mean of brands/trademarks

S_{BTM} = the sample standard deviation of brands/trademarks

N = number of observations in the sample

∑ = summation symbol

Decision Rule

Reject the null hypothesis if the correlation coefficient is negative, otherwise accept null hypothesis.

Data Presentation and Analysis

Data Presentation
Five oil and gas firms listed on Nigeria Stock Exchange, namely Oando Nigeria Plc, Mobil Plc, Capital Oil Plc, Gas Link Plc and African Petrol were selected for the study. The panel data collected from the annual accounts and financial statements of the firms during the period of 2011 to 2020 are presented in appendix I.

Test of Hypothesis

The test of hypothesis was carried out as follows;
Step 1: Re-statement of the hypothesis in the null and alternate forms
Step 2: Statement of decision criteria
Step 3: Presentation of test result
Step 4: Decision

Test of Hypothesis one

Step 1: Restatement of the hypothesis.
Goodwill does not positively and strongly relate with net asset of oil and gas firms in Nigeria.

Step 2: Statement of Decision Criteria
Reject H_O if the correlation coefficient is negative.
Step 3: Presentation of test result

Table 1: Test of Hypothesis One

Covariance Analysis: Ordinary
sxDate: 12/06/21 Time: 18:18
Sample: 2011 2020
Included observations: 49
Balanced sample (listwise missing value deletion)

Correlation
t-Statistic

Probability	BRANDS/ TRADEMARKS	COMPUTER SOFTWARE	GOODWILL	NET ASSETS
BRANDS/ TRADEMARKS	1.000000 ----- -----			
COMPUTER SOFTWARE	0.335177 2.438938 0.0186	1.000000 ----- -----		
GOODWILL	0.607821 5.247635 0.0000	0.714975 7.010824 0.0000	1.000000 ----- -----	

NET ASSETS	0.676900	0.774902	0.689580	1.000000
	6.304511	2.772405	3.849257	-----
	0.0000	0.0080	0.0004	-----

Source: Author's Computation from E-View 9.0

Step 4: Decision
Given the decision criteria to reject H$_O$ if the correlation coefficient is negative and to ascertain the extent of relationship (weak/strong), the correlation co-efficient must be greater than 50% for a strong relationship and less than 50% for a weak relationship. Table 4.4.1 shows the correlation coefficient of 0.689580. Since, the correlation coefficient is positive and approximately 69%, it is therefore concluded that goodwill positively and strongly relates with net asset of oil and gas firms in Nigeria.

Test of Hypothesis Two

Step 1: Restatement of the hypothesis.
Software does not significantly relate with net asset of oil and gas firms in Nigeria.

Step 2: Statement of Decision Criteria
Reject H$_O$ if the correlation coefficient is negative

Step 4: Decision
Given the decision criteria to reject H$_O$ if the correlation coefficient is negative and to ascertain the extent of relationship (weak/strong), the correlation co-efficient must be greater than 50% for a strong relationship and less than 50% for a weak relationship. Table 4.4.1 shows the correlation coefficient of 0.774902. Since, the correlation coefficient is positive and approximately 77%, it is therefore concluded that software positively and strongly relates with net asset of oil and gas firms in Nigeria.

Test of Hypothesis Three

Step 1: Restatement of the hypothesis.
Brands/trademarks does not significantly relate with net asset of oil and gas firms in Nigeria.

Step 2: Statement of Decision Criteria
Reject H$_O$ if the correlation coefficient is negative.

Step 4: Decision
Given the decision criteria to reject H$_O$ if the correlation coefficient is negative and to ascertain the extent of relationship (weak/strong), the correlation co-efficient must be greater than 50% for a strong relationship and less than 50% for a weak relationship. Table 4.4.1 shows the correlation coefficient of 0.676900. Since, the correlation coefficient is positive and approximately 68%, it is therefore concluded that brands/trademarks positively and significantly relate with net asset of oil and gas firms in Nigeria.

Discussion of Findings
The following results were generated from the analysis of study;

Discussion of Hypothesis One

Goodwill positively and strongly relates with net asset of oil and gas firms in Nigeria due to the fact that the correlation coefficient being 0.689580 was approximately 69% which is indicative of a positive and strong relationship. This discovery is in agreement with the finding of Awa, Okwo & Obinabo (2020) who examined the effect of intangible assets on corporate performance of selected commercial banks in Nigeria from 2012 to 2018. They revealed that goodwill and computer software have statistically significant effect on the return on assets.

Discussion of Hypothesis Two

The study discovered that software positively and strongly relates with net asset of oil and gas firms in Nigeria based on the premise that the correlation coefficient being 0.774902 was approximately 77% signifying a strong and positive relationship. This assertion is in agreement with the findings of Zaroug & Mawih (2020). They studied the effect of intangible assets, financial performance and financial policy on the firm value of Omani industrial firms listed in the Muscat Securities Exchange from 2010 to 2014 and found out that intangible assets, financial policies and financial performance have a significant influence on firm value

Discussion of Hypothesis Three

The study discovered that brands/trademarks positively and strongly relate with net asset of oil and gas firms in Nigeria due to the fact that the correlation coefficient being 0.676900 was approximately 68%. This discovery was buttressed by Qureshi & Siddiqu (2020). They investigated the degree to which intangible assets affect financial performance, financial policies and market value of the technology firm in 14 Countries from Different Continents from 2015 to 2018 and discovered that the higher the intangible assets owned by a firm, the higher firm's ability to generate profits.

Summary of Findings

The findings from this study are hereby summarize as follows;
    I.   Goodwill positively and significantly relates with net asset of oil and gas firms in Nigeria.
    II.   Software positively and significantly relates with net asset of oil and gas firms in Nigeria.
    III.   Brands/trademarks positively and significantly relate with net asset of oil and gas firms in Nigeria.

Conclusion

Intangible assets usually relate to innovations implementation, technology development or marketing activities. Their importance in different firms varies, however it is proved that intangible assets in combination with other tangible assets are among the main drivers of competitive advantage and corporate profit. It is only a well-established brand, know-how or other intangible assets that can guarantee business profitability, continuity and growth as it was concluded that goodwill, software and brands/trademarks positively and strongly relate with net asset of oil and gas firms in Nigeria.

Recommendations

Based on the findings and conclusions of the study, we suggest the following recommendations to the management of oil and gas firms in Nigeria;

    I.   Oil and gas firms in Nigeria should develop business policies that will increase the goodwill of their firms.
    II.   Oil and gas firms in Nigeria should also invest in modern computer software that will assist them in oil and gas exploration, mining and production. It will also assist the firms in the marketing and distribution of oil and gas.
    III.   The firms should equally strive to develop strong brands and trademarks that will distinguish their products from the competitors' products. This will among others assist the firms checkmate fake and adulterated products which are rampant in the Nigeria economy.

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