Intangible Asset Investment and Business Sustainability of Deposit Money Banks in Nigeria

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ABSTRACT

In recent years, research has shown that companies have steadily increased their investment in intangible assets relative to tangible assets, and many scholars have studied the impact of these investments on firm's profit and performance. However, there have been very few studies examining the impact of these investments on the sustainable growth of firms in Nigeria. This study investigated the impact of intangible asset investment on the business viability of Nigerian deposit money institutions. The investigation employed an ex-post facto design with a sample size of twelve deposit money institutions. The analysis utilised secondary data obtained from the Nigerian Exchange Group. The random effect regression analysis technique was used to analyse the data, and the results indicated that goodwill intensity has a significant positive effect on sustainable growth rate, whereas asset intangibility intensity has a significant negative effect on the sustainable growth rate of deposit money banks in Nigeria. Therefore, the study concludes that investment in intangible assets has a significant impact on the business sustainability of Nigerian deposit money banks. For sustained business growth, the study recommends that deposit money institutions invest more in intangible assets.

Keywords: Intangible Assets, Investment, Business Sustainability, Sustainable Growth Rate, Goodwill

INTRODUCTION

Change has been a constant in life, and it has had an impact on all human endeavours. The effect of change on a company's operation has a direct bearing on its mode of operation. In recent years, technological advancements and commercial expertise have increased. There is now a shift in business emphasis towards growth based on skills, knowledge, digital and other technologies, with less emphasis on infrastructure and physical assets, thereby altering the conventional business model.

Current research indicates that businesses have increased their investment in intangible asset components relative to investments in tangible assets over time. For instance, Bordianu (2014) reported that the ratio of tangible to intangible assets in 1929 was 70/30, but by 1990, it had shifted to 37/63, and it continues to follow the same pattern. Bordianu also noted that by 2002, 81 percent of the leading European and American companies were actively investing in intangible assets, with 50 to 90 percent of the value created by these businesses stemming from the management of intangible assets rather than tangible assets. Sundaresan et al. (2021) report that, according to the most recent studies, many high-tech companies in the most developed nations today ascribe more than 90 percent of their business value to intangible assets. So, what is the situation in Nigeria?

The same holds true for Nigeria, where there have been substantial investments in intangible assets. However, these investments are relatively low compared to those of advanced nations, which is

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understandable given Nigeria's environment and level of development. Financial institutions, particularly deposit money banks (DMBs), are among the various sectors and key actors where investments in intangibles have had a significant impact and been readily apparent. The institutions have witnessed a phenomenal increase in Intangible Assets. The ratio of reported total intangible assets to tangible assets increased from 1% in 2010 to 16% in 2020, according to an analysis of the annual reports of listed deposit money institutions obtained from the Nigeria Exchange group in 2022.

The sector of DMBs is at the vanguard of innovation in contemporary business operations. "Through electronic devices such as mobile phones and computers, clients are provided with services in a convenient manner, even if they do not enter a bank branch. Prior to a few years ago, the number of new branches built by Nigerian banks was one of the main performance indicators used to assess their success, and massive recruitment efforts were made to staff these branches with the goal of bringing bank services closer to as many people as possible. Even though the emphasis on providing banking services to as many people as feasible persists, the channel has shifted in recent years. To reach the greatest number of consumers, banks rely primarily on Internet and mobile banking. With laptops and the internet, mobile phones and the internet, or an Unstructured Supplementary Service Data (USSD) code, the vast majority of banking services can now be performed in nearly every Nigerian household. Without physical barriers, transactions are conducted across the country and across international borders. This innovation has decreased the number of individuals visiting banks to conduct business, thereby decreasing the investment in tangible banking assets such as structures and equipment. During the global pandemic of coronavirus disease 2019 (COVID-19), despite the lockdown and restriction of movement in 2020, banks were still able to provide a significant level of service, thereby reducing the negative impact of the pandemic on individuals, particularly in terms of sending and receiving money.

This modern method of conducting business necessitates a substantial capital investment due to the fact that it is driven by constant changes in fashion and innovation, necessitating the need and expense of continuous upgrading and, in some cases, a complete overhaul, unlike physical or tangible assets. Therefore, organisations are required to strategically raise and account for this cost. In order to raise funds, an organisation must strategically select its source. Internally, the company could issue additional shares or reduce dividend payouts to shareholders, whereas going external could result in an increase in debt. There are costs associated with each of these, including the cost of issuing shares, dilution of earnings per share, excessive finance costs, and loss of stock value, among others. Choosing the right source of funds and investing in the right intangible assets provides organisations with a comparative advantage, resulting in increased profitability and expansion. Typically, growth is associated with an increase in basal profitability and a decrease in costs due to economies of scale and expansion (Losch, 2017).

Once growth is achieved, the next major challenge is managing and maintaining sustainable growth, as accelerated growth can overload corporate resources, necessitating new borrowing to prevent corporate insolvency (Xu et al., 2021), and unchecked slow growth can cause stagnation, which can negatively impact the banking sectors in particular and the Nigerian economy as a whole. Moreover, if growth is not properly managed and funds are linked to the development of intangible assets, it may pose a threat to the organization's viability. Investment in intangible assets ought to result in expansion, and if the expansion is not effectively managed, it could lead to organisations increasing their financial leverage, which could result in financial distress. In this case, organisations and institutions invest heavily in intangible assets to gain a competitive advantage on the market, thereby increasing their consumer and revenue base" If all other factors remain constant, a high revenue base leads to growth. However, if an organisation expands at a rate other than the sustainability rate, one or more of the fundamental business ratios must change because additional funds will likely be raised to meet demand. Therefore, businesses must methodically investigate methods to strategically expand their base of intangible assets and sustain growth. There has been limited research on the impact of intangible assets investment on the business sustainability of firms in Nigeria

(Olaoye, Akingbade, and Okewale, 2020), and even less on the business sustainability of listed deposit money institutions in Nigeria; this research void must be filled. The specific objective of this paper is to investigate the impact of intangible asset investment on the business sustainability of Nigerian deposit money institutions. The hypotheses to be tested are as follows:

H01: Asset Intangibility Intensity does not have any significant effect on the business sustainability of deposit money banks in Nigeria.

H02: Goodwill Intensity does not have any significant effect on the business sustainability of deposit money banks in Nigeria.

LITERATURE REVIEW

Conceptual Framework

Intangible Assets

A company's Statement of Financial Position at the end of the fiscal year classifies its assets as either tangible (Physical assets) or intangible (Non-physical assets). This research will concentrate solely on intangible assets due to its purview. Intangible assets are regarded as one of the most important aspects of a business. Additionally to working capital and tangible assets. Consequently, these elements make it possible for the business to operate and have the potential to be the most important contributors to a company's success and competitive advantage (Samer, 2020). Numerous academics and organisations have weighed in on the topic of intangible assets. The Organisation for Economic Co-operation and Development (OECD) (2015) defined intangible assets as "something that is neither a physical asset nor a financial asset, that can be owned or controlled for use in commercial activities, and whose use or transfer would be compensated had it occurred in a transaction between independent parties under comparable circumstances. In a similar vein, Amer et al. (2021) assert that intangible assets lack physical substance like equipment or fortune, but are one of the most important long-term assets for an organisation or business. Intangibles were defined by Zaroug and Mawih (2020) as non-physical factors that contribute to or are used in the production of commodities or the provision of services, or that are anticipated to generate future productive benefits for the individuals or organisations that control their use.

International Accounting Standard (IAS) 38 defines an intangible asset "as a monetary asset that lacks physical substance and is identifiable. An asset could be defined as a resource controlled by an entity as a result of past events (such as purchase or self-creation) and from which future economic benefits (cash flows or other asset inflows) are anticipated. Intangible assets include patented technology, computer software, databases, and trade secrets, trademarks, trade dress, newspaper mastheads, internet domains, video and audiovisual material (e.g., motion pictures, television programmes), customer lists, mortgage servicing rights licencing, royalty and standstill agreements import quotas franchise agreements customer and supplier relationships (including customer lists) marketing rights.

Intangible assets are primarily knowledge-based and have risen to prominence as a result of humans' persistent efforts and eagerness to acquire more information. Thus, it is also known as knowledge assets or intellectual capital. (Miho 2015; Okoye, et.al 2019). Intangible assets include computer software, artificial intelligence and machine learning, computerised databases, research and development (R&D), copyright, licence, design, advertising, marketing, firm-specific human capital, and organisational capital. Corrado, et al. (2009) have grouped them into three categories: computerised information, which includes computer software and computerised databases; innovative property, which includes research and development (R&D), copyright, licence and design; and economic competencies, which include advertising, marketing, firm-specific human capital, and organisational capital. The majority of these asset types are capitalised over

a period of time, requiring a substantial initial investment. The focus of companies, financial analysts, investors, accountants, and regulations has shifted to intangible assets. This has prompted efforts to comprehend and narrow the disparity between the accounts of companies and their market value (Barton, 2005).

Since not all intangibles can be measured and included in the financial statement, accounting for intangibles has been a challenge for accountants throughout the years and even to this day. Intellectual properties, brand value, legal rights, and patents lack a universally accepted method of measurement. Nonetheless, significant progress has been made in accounting for intangibles in general. The International Accounting Standard (IAS) 18 is dedicated to Intangibles, for example. IAS 18 identified three essential characteristics for valuing intangible assets: (i) identifiability that is, separability (capable of being separated and, rented, sold, transferred, licenced, or exchanged, either individually or in conjunction with a related contract), and the existence of contractual or other legal rights. (iii) economic benefits (such as revenues or prospective cost reductions). If an intangible item does not meet both the definition (an identifiable non-monetary asset without physical substance, controlled by the entity as a result of past events and from which future economic benefit is expected) and criteria for recognition as an intangible asset, IAS 38 requires that the expenditure of such an item be recorded as an expense when incurred. It follows that, in some instances, intangible assets" are regarded as an expense, whereas in others, they can be capitalised.

Asset Intangibility Intensity

The Asset Intangibility Intensity is used to determine the proportion of an organization's intangible assets to its total assets. Totaling the value of intangible assets, including goodwill, and dividing by total assets yields the rate. The value reflects the Intangible asset intensity rates. This rate establishes the proportion of intangible to tangible assets. It is crucial that the cost of intangible assets be measured accurately and that companies report these items as assets; otherwise, a significant portion of the money spent on intangible assets and their components will be expensed in the year they are incurred, thereby reducing the actual value of investment made in Intangible assets. In Nigeria, for instance, the reported operating expenses for Information Technology and related costs in 2020 for listed deposit money institutions are equal to fifty percent of the reported value for intangible assets on the Statement of financial position. Using only the Statement of financial position to determine the amount of money an organisation has invested in intangible assets is omitting a significant amount of information. This situation in Nigeria is reiterated by Buinskien (2017), who argued that the recognition of intangible assets and their accounting for the Statement of Financial Position are complex. In the majority of instances, the costs incurred by businesses that are not accounted for as intangible assets are either included in the cost of production or recognised as operating expenses, thereby diminishing not only the quality of accounting information but also the property of the owners as reported in the financial statements.

Goodwill Intensity

Goodwill Intensity is used to assess the rate of Goodwill relative to an organization's total assets. Calculating the rate involves dividing goodwill by total assets. The value indicates the intensity of benevolence. This rate determines the proportion of intangible assets to goodwill. Obviously, a great number of academics and institutions have defined and provided their opinion on how Goodwill can be accounted for. Goodwill is defined by the American Institute of Certified Public Accountants of the United States (AICPA) as all intangible assets and supporting assets that contribute to the competitive advantage of a business relative to other analogous businesses in the same industry. Goodwill is the intangible asset resulting from a company's name, reputation, consumer loyalty, location, and products that cannot be identified separately. (IFRS 3 Business Combinations, IASB, paragraph 51, 2004) Goodwill is defined by the International Accounting Standard Board as the future economic benefits derived from assets that cannot be identified and separately recognised individually. According to Elliott and Elliott (2015), this definition

demonstrates that the total value of a corporation is greater than the sum of its countable and identifiable assets. According to Sarno (2017), goodwill is the aggregate of a company's identifiable and non-identifiable assets that contribute to an increase in the company's market price over the value of its identifiable assets. Goodwill may be defined as the difference between a company's current market value and the sum of its assets' individual values. Goodwill can be created for a company, according to Friberg and Johansson (2018), when value can be obtained from the synergies generated by the company's assets.

There are two distinct categories of goodwill, the first being goodwill acquired through a merger or acquisition. This variety of goodwill is not covered by the IAS 38 standard, so the IFRS 3 standard is employed when calculating its value. The second is internally developed goodwill, which falls under the purview of IAS 38 but is not recognised as an asset because its source of origination cannot "be identified as a resource. Although it is subject to IAS 38, it is not recognised as an asset because there is no way to determine its resource origin. As a premise for the calculation of internally generated goodwill, the difference between the firm's fair value and the value of its net assets as reflected on the balance sheet is utilised. This difference is determined by deducting the company's fair value from the value of its net assets. Numerous factors, such as good creditworthiness, a good location, or even good product quality, can contribute to its formation. Unlike purchased goodwill, however, non-purchased goodwill cannot be included in a company's balance sheet (Vogne and Van Zuylen, 2018). Companies are required by IFRS 3 to compute the value of their goodwill at least once a year in order to assess for impairment. "An asset must not be carried in the financial statements at a value greater than the maximum amount that can be recovered from its use or sale."

According to Sarno (2017), the first method utilised in accounting was writing off the cost of goodwill directly to reserves in the year of the acquisition. Since the investor (or the customer) views the business as a going concern and is therefore willing to pay the excess premium for the business (goodwill) in anticipation of future higher profits, it would be improper to write off goodwill in the year of acquisition. This is due to the fact that the decline in goodwill value does not occur at the time of acquisition, but rather decreases progressively over time. Thus, each year a loss in the value of goodwill should be levied. By charging reserves directly, this expense will not appear on future income statements. As a consequence, a second method was adopted that necessitated reporting the cost of goodwill on the statement of financial position (Elliott and Elliott, 2015). This method was criticised primarily for its inaccuracy, as the value of goodwill is likely to fluctuate or even decline over time. It would be inaccurate to leave goodwill unaltered in the statement of financial position and not amortise it annually.

The third method entailed reporting goodwill at cost, but depreciating it over its anticipated lifetime. Theoretically, this method is more appealing, but in practise it would be very difficult to precisely determine the life of goodwill and select an appropriate method for amortisation, given that the life of goodwill can vary substantially by company, industry, and product. This difficulty illustrates this method's limitations. Lastly, the current valuation of goodwill adheres to IFRS rules that prohibit goodwill amortisation and consider it as an asset with an indefinite life (Elliott and Elliott, 2015). Goodwill must be reported at cost and assessed for impairment annually. If the value of goodwill exceeds its recoverable value in any given year, the difference must be written off. Nonetheless, some contend that this method has disadvantages: under the new rules, it is presumed that goodwill has an" indefinite economic life, which makes it impossible to make a realistic estimate of goodwill's actual economic life (Elliott and Elliott, 2015).

Business Sustainability

Sustainability is the process of living within the limits of available physical, natural, and social resources in a manner that allows the living systems within which humans are embedded to flourish. It is a holistic approach that considers ecological, social, and economic dimensions, recognising that they must all be taken into account simultaneously in order to achieve enduring prosperity. Before it became ubiquitous in this

way, however, sustainability was primarily associated with growth that a company or national economy could maintain without encountering problems; this is the focus and scope of this paper. The concept of the latter has been extensively debated in relation to sustaining an organisation with its available resources. This is predominantly related to development and has been discussed by numerous scholars.

According to Ocak and Findik (2019), the term sustainable development emerged in the 1970s in the field of business, referring to enterprises' optimal growth from a financial standpoint. Consequently, it indicates the utmost rate at which a company can develop using only its own resources and no outside financing. According to Parker et al. (2010), sustained business growth over a longer period of time necessitates the opportune adaptation of a company's organisation and strategies; otherwise, fast-growing companies may become "one-hit wonders" and lose their relevance. Many businesses face difficulties if they are unable to manage and sustain growth. "According to Serbian et al. (2015), growth is the objective of both firms and economies, but increased volatility can contribute to failure inadvertently. In contrast, business sustainability is the pursuit of long-term high growth with low adverse risk. In the context of businesses, they add that sustainability can be operationalized through three measures: growth persistence, which they define as the correlation of growth rates over time; volatility, the uncertainty and risk associated with growth; and survivability, which accounts for firm closure.

The business sustainability of companies is essential and advantageous for all stakeholders and the Nigerian economy as a whole. However, accelerated growth overburdens corporate resources and necessitates additional borrowing to prevent insolvency (Xu et al., 2021). If such growth is not properly managed and funds are linked to the development of intangible assets such as software in order to keep up with the rapid change in fashion, it could pose a threat to the organization's viability. Due to a rise in assets and operating expenses, rapid expansion may result in a loss of coordination throughout the organisation. The Sustainability growth rate (SGR) measures sustainability growth. Therefore, the growth rate is a complex long-term indicator of the company's business and financial performance. Unsustainable growth is any development that deviates from a sustainable growth rate (Xu et al., 2021). The sustainable growth rate constrains organisations that want to maintain a target" payout ratio and capital structure without issuing new equity.

Sustainable Growth Rate

A company's sustainable growth rate is the fastest and most stable pace of expansion it can accomplish without resorting to debt financing. When a firm expands at a rate slower than it can sustain, it risks losing its edge in the market. A company's financial health might deteriorate if it grows faster than it can afford (Rastic et al. 2021). There are a few different ways to quantify the rate of increase in sustainability, but the first and most well-known is the Higgins model (Arora et al., 2018). Higgins (1977) provides a condensed version of this formula: SGR = ROE (Return on Equity) x b (Retention Rate). The return on equity (ROE) indicator is a time-tested metric that can be determined using the formula ROE = Net profit / Shareholders' equity. After paying out dividends, the percentage of retained earnings (RetRate b) shows how much money is left over for the company to spend in its core operations. Dividend payout rate is net profit divided by net profit before dividends.

Revenue Growth

Growth of a company's revenue during a certain time period may be quantified using this metric. The rate of growth in revenues is calculated by dividing the sum of current revenues by the sum of revenues for the same period last year. That is, Total Revenue in Year 2 minus Total Revenue in Year 1 divided by Total Revenue in Year 1.

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Empirical Review

The impact of intangible assets on the bottom line and the strategy of developing market commercial banks was studied by Bayelign and Ayalew (2022). The research looked at 17 different commercial banks in Ethiopia from 2017 to 2020 to empirically determine the impact of intangible assets on financial performance and policy. The debt level was utilised as an indicator of financial policy while returns on assets and equity were used to evaluate business success. Asset size and liquidity are utilised as control factors, whereas intangible asset is the primary explanatory variable. The panels were estimated using a random effect method. Results showed that at the 5% level of significance, intangible assets positively affect financial performance as evaluated by Return on Asset (ROA) and Return on Equity (ROE), while at the 1% level of significance, they negatively affect the financial policy of commercial banks in Ethiopia. The research also discovered that ROA and ROE are positively impacted by asset size at both the 1% and 5% levels of significance. At the 5% threshold of significance, the liquidity ratio also has a beneficial influence on financial performance as measured by ROA and ROE. Finally, the results showed that, at the 10% and 1% significance levels, asset size and liquidity ratio significantly affect the financial policy of commercial banks in Ethiopia. Therefore, the research found that both tangible and intangible assets contribute to financial performance and policy. Therefore, in order to maximise shareholder wealth and have optimal debt, boards and managers of commercial banks should plan and maintain an acceptable ratio of intangible assets to total assets. Although the work is well-researched and makes use of appropriate statistical methods, its panel regression result may be affected by the fact that it only covers the years 2017-2020.

Mohanlingam et al. (2021) looked at how "intangible assets affected the bottom lines and strategies of publicly traded Thai IT companies. The purpose of this research was to examine the connection between intangible assets and the financial success and strategy of publicly traded technology companies in Thailand. Thirty-three out of a total of 38 technology businesses traded on the Stock Exchange of Thailand were included in the study's collection and analysis of data. Analysis of intangible assets, financial performance, and financial policies was conducted using descriptive statistics, Pearson's correlation, and regression analysis. Its secondary objective was to assess how moderating factors like business size, leverage, and sales growth affect the connections between intangible assets, financial performance, and financial regulations. Intangible assets (IA) were shown to significantly correlate positively with profitability (ROE) of publicly traded technology companies in Thailand. The research also discovered a favourable correlation between intangible assets and debt-to-equity ratios in financial policy. Firm size and leverage were revealed to be important moderators of these associations. Financial performance (return on equity) and financial policy (debt) were examined as they related to technology enterprises in Thailand, and theoretical notions related to intangible assets were developed. These results may be utilised to persuade technologists in Thailand to put more money into intangible assets, which will increase the sector's profitability. In addition, the correlations between intangible assets and return on equity (ROE) and debt to equity were significantly moderated by the size of the firm. Companies in the technology sector with a larger stock of intangible assets tend to be larger (in terms of sales revenue generated) and more profitable. The study only looks at data from 2015–2019, which is a rather short time frame and may distort the statistical results of the paper's analysis.

The importance of intangible assets on the success of firms listed on the Tehran Stock Exchange was examined in a study by Arianpoor (2021), titled The Impact of Intangible Assets on Firm Performance: Evidence from an Emerging Economy. A huge dataset covering 1350 firm-years over the decade 2008-2018 is analysed using multiple linear regression. It's common to evaluate a company's success based on four metrics: the ROIC, ROE, NPV, and NPV margin. The corporation employed the three control variables of leverage, net sales growth, and total company size. Both unrecorded and reported intangible assets were shown to have a beneficial effect on company performance as evaluated by the independent variables of return on assets, return on equity, net profit, and profit margin. The article emphasised the outsized impact

that intangible assets have on a company's bottom line. Managers in developing countries may be able to benefit from paying more attention to intangible assets as a result of the findings of the current study. This is what we found, anyhow. Managers and the board of directors, the paper argues, should give serious thought to the effect of intangible assets (including documented, unrecorded, and legacy intangible assets). Among the many intangible assets, the article claims that the identification of unrecorded intangible assets creates a more desirable performance, namely the intangible properties (in particular, unrecorded intangible assets). In addition, they suggested that standard-setters (in Iran) pay more attention to the development of intangible assets and the changes they bring about. To aid investors and other users in comparing firms in the same line, he suggested that companies listed on the Tehran Stock Exchange use the same method for identifying and disclosing intangible assets. Potentially confusing findings" stem from the study of intangible assets of 1350 enterprises registered on the Tehran Stock Exchange. Better research impact may have been achieved with a sectoral interpretation showing the effect of intangible assets on certain sectors.

Rastic et al. (2021) conducted research on the effect of intangible assets on the SGR of businesses in Serbia. The authors used the VAIC model to analyse the results and found that intangible assets had a significant effect on SGR. According to the Serbian Business Registers Agency, the industries included on the shortlist represent Serbia's most lucrative economic sector in 2018. The hypothesis was verified using a combination of synthesis, analysis, and correlation techniques. Companies' financial statements (balance sheets (Statement of Financial Position) and income statements) for the years 2015-2019 were utilised as part of the study's sample. Manually entering company identifiers or company names into the SBRA (2020) search engine yielded the applicable financial statements for the time period. The findings revealed that intangible assets significantly influenced the sustainable growth rate of the organisations. The influence of intangible assets on the observed firms' long-term growth rate is larger than the impact of physical assets. Compared to other studies on intangible assets, this one adds something new to the conversation. It also serves as an incentive for Serbian business leaders to prioritise the development and use of intangible assets. This is especially true in light of the findings from this study, which show that investments in intangible assets result in a higher rate of long-term economic growth for businesses. However, it may be hard to tell if a result is a genuine finding if the population size is small and it just covers the years 2015-2019.

Evidence from intellectual capital investment in firms traded on the Bucharest Stock Exchange "was used by Ionita and Dinu (2021) to examine the impact of intangible assets on long-term growth and company value. The research looked into how monetary value is created from a company's investment in intellectual capital (IC). The objective was to examine the effect of intangible assets on the value of a company and its potential for long-term expansion. The study used computational models to calculate the sustainable growth rate (SGR) and the firm value (FV), and then evaluated the connection between the dependent variables and spending on intangibles like R&D, IT programmes, and patents by means of a linear regression analysis using the ordinary least squares (OLS) model. Out of the 78 firms listed on the Bucharest Stock Exchange (BSE), 42 were chosen to have their financial reports reviewed for adequacy in terms of the years 2016–2019. The research found that listed Romanian businesses' SGR and FV were negatively affected by intangibles categorised as innovative skills (R&D and Patents). In addition, research and development has a negative and considerable influence on FV, whereas information technology programmes have a positive and significant impact on FV but no effect on the SGR. Both the economic competences (such as brands and shares owned in affiliates and jointly controlled organisations) and the firm structure factors (such as leverage and company performance) appear to have a major impact on SGR and FV. For BSE-listed firms, the value of their shares in associated and jointly controlled entities is a key determinant. The research found that in order to secure the long-term and sustainable development of their businesses, companies trading on the Regulated Market of the Bucharest Stock Exchange should keep the scope of their liabilities manageable while financing intangible assets." In addition, in order to keep their competitive edge, these businesses should keep stressing the significance of intangible assets and investing more in certain components. To achieve sustainable growth and boost firm performance, managers must recognise the responsibilities of

intangibles and devise strategies to invest in lucrative intangibles by properly allocating scarce resources. It may be difficult to assess if a result is a genuine finding if the population size is only four years (2016-2019).

With the goal of determining how Goodwill (GW) and Computer Software (CSW) affect commercial banks' return on assets in Nigeria, Awa et al. (2020) examined the impact of intangible assets on corporate performance in the country's banking sector. Data from the audited financial statements of nine commercial banks were utilised to conduct an Ex-post Facto study utilising the panel data approach to examine the impact of intangible assets on corporate performance from 2012 to 2018. We estimated random and fixed model effects jointly using pooled ordinary least square (OLS) for our baseline panel regression analysis. The purpose of these estimates was to assess the potential importance of a link between the dependent and independent variables. The best-fitting model (pooled, random, or fixed effects) was chosen using the Hausman test. The study relied heavily on two factors pertaining to intangible assets and commercial bank corporate performance. Computer software (CSW) and goodwill (GWL) were the independent variables representing intangible assets, while return on asset (ROA) represented the commercial banks' corporate performance as a proxy for the dependent variables. The results showed that the factors used—Goodwill (GW) and Computer Software (CWS)—had a statistically significant impact on ROA. This suggests that actual assets aren't the only way commercial banks measure success. Given the substantial impact intangible assets have on the performance of Nigeria's commercial banks, it is advised that greater care be given to Goodwill (GW) and Computer Software (CSW) by the banking sector. That means GW and CSW are indispensable to Nigeria's commercial banks. The paper's population specifically identifies the types of commercial banks in Nigeria, however the research only covers the past seven years. This limits the study's generalizability.

To better understand how intangible assets affect intellectual capital and competitive advantage in Pakistan's banking industry, Nosheen and Sadiq (2020) conducted research. This article conducted the empirical tests necessary to confirm the concept that intangible assets, which include resources, add to the banking industry's intellectual capital and competitive advantage. It also assessed whether or not the intangible nature of a bank's resources helps to provide a long-term competitive advantage. Finally, it identified the specific contributions of intangible assets to the banking performance. Secondary data were used in this study, namely information gathered from the annual reports of commercial banks trading on Pakistan's principal stock markets. In order to conduct the study, the sample was first partitioned into two broad groups. There was also the division between Islamic banks and other types of banks. However, no empirical research has been conducted on the effects of Islamic banking's greater reliance on intangible resources on its intellectual capital and competitive advantage. The years 2008-2019 are used as the time period of study. Research and development spending, training and innovation costs, and intangible asset valuations were used to quantify intangible resources as the study's independent variable. Profitability (as measured by return on assets) and Intellectual Capital (as measured by Value Added to Intellectual Capital) are the dependent variables. Size of the bank, leverage, concentration ratio, and gross domestic product per capita serve as the independent variables. Both Islamic banking theory and banking management practises may learn a great deal from this study's conclusions. While intangible assets have a substantial effect on Islamic banks' intellectual capital and competitive advantage, they have a far smaller effect on conventional banks' intellectual capital and competitive advantage. According to the study, the banking industry, in which traditional banks still hold the lion's share of the market, is not yet ready to abandon the traditional performance indicators. Islamic banks have had tremendous growth and client acceptability over the past decade, but their fraction of the banking market is still too small to warrant disregarding the established main competitors.

Using data from Omani manufacturing firms registered on the Muscat Securities Market between 2010 and 2014, Zaroug and Mawih (2020) examined the impact of intangible assets, financial performance, and financial policies on business value. A total of 46 manufacturing firms were used to pilot test the study's

novel concept. Intangible assets, financial policy, and financial performance were employed as the independent groupings of variables. Tobin's Q ratio is used to evaluate dependent variables, whereas excess returns are used to evaluate intangible assets. In addition, profitability, liquidity, and assets turnover are used to evaluate financial performance, while debt and dividend policies are used to evaluate financial policy. Using the econometric model and regression analysis, we employed the pooled OLS technique to assess our assumptions. The model's regression equation has positive and statistically significant relationships between the variables. Since firms with high levels of asset turnover, leverage, and intangible asset value also tend to have high Tobin's Q values, these factors contribute to a company's overall financial success. There are several theoretical and policy ramifications stemming from this study. First, the results corroborated the value creation concept, which holds that a company's worth is determined by its stock of both hard and soft assets. Second, the results of this study provide credence to the idea that several factors, such as a company's financial performance, financial policies, and intangible assets, all have a role in determining its worth. Finally, the results have policy implications, showing that many industrial enterprises contain sizable quantities of intangible assets that have to be declared in the financial reports of such businesses. Auditors should also utilise audit reports to provide a message to readers of financial statements about the value of intangible assets. However, the paper's use of excess returns to value intangible assets is at odds with other studies in the field, and the authors only looked at data from the previous five years to draw their conclusions.

Intangible asset investment and company performance: evidence from Korea's SMEs was the focus of research by Seo and Kim (2020). In this article, we looked at how putting money into intangible assets like human capital, advertising, and research and development may boost a company's bottom line. Small and medium-sized enterprises (SMEs) must carefully consider the pros and cons of investing in intangible assets. Six years' worth of information covering all 646 Korean SMEs in manufacturing were collected and analysed using hierarchical regression. Profitability and valuation are the dependent variables, while human capital, marketing, and research and development are the independent variables, and the study's control factors are the firms' age and size. The findings showed that goodwill, customer loyalty, and intellectual capital all contribute to a company's bottom line. The research showed that spending money on intangible assets is not a waste for SMEs. Therefore, company managers should spend more in intangible assets in order to boost the firm's profitability and give a positive flow for the firm's value to investors. One of the most intriguing results is that a company's profitability and value are affected more by advertising expenditures than by any other single factor. The greatest decisions about business operations and investments may be made with the use of information about a company's profitability and enterprise value. Business managers should strategically employ these three major contributors and implement investment in intangible assets to achieve their management goals, given that enterprises can spend in human capital, advertising, and R&D singly or in tandem to increase their performance. In addition, they argued that intangible assets, which they posited as a potential source of economic growth, need long-term sustainable investments whose outputs include the generation and amassment of knowledge. This success has far-reaching implications for businesses since it may be applied to many other areas. To encourage SMEs to invest in intangible assets, governments should implement promotional measures.

Theoretical Framework

Resource-Based Theory

Penrose brought the "Resource-Based view" ("RBV") to the area of strategic management in 1959. RBV is a framework for understanding the value of a company's knowledge, assets, and processes in maintaining a competitive advantage. In 1980, "building on the groundwork laid by Wernerfelt (1984) and Barney (1991), the resource-based view of a business was expanded further with the aim of gaining a competitive edge. They argue that businesses should stop turning to the external world and other sources in order to gain

competitive advantage, and instead focus inside. Bundling or combining such resources may be mutually reinforcing and further distinguish the firm's strengths, as proposed by the resource-based idea. The resource-based perspective looks at the resources available to businesses in an effort to explain why some businesses are more successful than others. According to the RBV, an organization's success is founded on its own unique set of strengths. It places emphasis on the company's own strengths and assets that may be used to bolster its competitive position. Using these tools, companies may better tailor their product and service offerings to meet the demands of their customers. Each of these materials is distinguished by one of four qualities. They are exceedingly rare, precious, difficult to replicate, and have few alternatives, as stated by Njuguna (2014). Barney (1991) argues that the resource-based (RB) paradigm was the first to recognise the value of intangible assets to businesses. This line of thinking holds that a business is nothing more than a network of interconnected material and immaterial assets. This suggests that the success of tangible assets is a necessary condition for the success of intangible ones. For a long time, businesses have understood that their assets, both real and intangible, were crucial to their success. With the passage of time, this theory's emphasis has switched from tangible to intangible assets (Reed et al., 2006). They argued that a company's plant and machinery, as well as its financial assets, are" not special and may be replaced by another at any moment.

Pecking Order Theory

It was Donaldson who initially put out the pecking order idea in 1961; by 1984, it had been developed by Stewart C. Myers and Nicolas Majluf. Businesses, according to the Pecking Order Theory of Capital Structure, accrue capital in a predetermined hierarchy. They argue that enterprises "should first look to their own resources for funding before exploring other options like loans or stock purchases. Internally produced money mostly comes from company profits. If a company follows the pecking order concept, its investments will be determined by its profit level. Information asymmetry is reduced in a pecking order theory context when financing comes from inside the company itself, as is the case with retained earnings. When compared to external financing options like debt or equity financing, where the business must pay fees to secure the funds, internal financing is the most cost-effective and time-efficient option. Managers prefer debt over stock when raising capital from outside sources due to the former's cheaper cost.

So, the notion of a pecking order might be useful when thinking about claims to assets and their relative seniority. Debt holders, in contrast to shareholders, have a higher claim to assets in the event of bankruptcy, but a lesser return expectation. Therefore, retained earnings are the most cost-effective form of financing, followed by debt and equity. Firms worry about funding their intangible asset investments with stock or debt, whether from inside the company or from outside investors, with an eye towards ensuring the investments will contribute to the long-term success of the business. Managers of businesses must strike a fair balance between the amount of money they have at their disposal and the amount they spend on intangible assets.

Knowledge-Based Theory

This perspective originates in the literature on strategic management, expanding and developing Penrose's resource-based view of the firm (1959) and its subsequent iterations (Wernerfelt 1984, Barney 1991). The thesis asserts that a company's competitiveness is founded on its knowledge-fueled skills and competences. Knowledge is a company's most valuable strategic asset, according to the knowledge-based theory of the firm (Njuguna, 2014). Knowledge is embedded in and transmitted through a wide variety of sources, including but not limited to organisational culture and identity, rules, procedures, documents, systems, and personnel. Knowledge is also strategically significant because of its appreciating value, in contrast to the depreciative qualities of more" traditional production variables.

Knowledge-based theory of the company is built on the foundation of the resource-based view "of the

business. The knowledge-based approach argues that knowledge is underappreciated in the resource-based perspective of the company because it is viewed as one of the firm's fundamental, generic resources. To bridge this gap and account for the strategic importance and practicality of knowledge-based resources, the knowledge-based theory of the firm was developed. Knowledge-based concepts imply competitive advantage by encouraging increased employee engagement in setting and achieving operational aims and long-term transformative objectives of the enterprise. Multiple factors, including regular deregulations, the ever-evolving competitive market circumstances brought on by globalisation, and technical developments, need the continuous acquisition and transmission of knowledge inside business organisations.

Since knowledge is typically considered a company's most valuable strategic asset, the knowledge-based theory provides the theoretical underpinnings for this research. According to Akhter 2020, knowledge is the primary force behind intangible assets. When employees have a vested interest in staying with a company and contributing to its success, the company's own knowledge-based resources become the key engine of a sustainable competitive advantage. The success of a company depends heavily on its intellectual capital, which is influenced by the organization's intangible" resources.

METHODOLOGY

This study employs secondary data from audited annual accounts for listed deposit money banks in Nigeria between 2012 and 2021 to test the impact of intangible assets on the strategic growth of these businesses using a post-hoc design informed by a positivist paradigm and a deductive approach informed by the panel data technique. As of the 31st of December, 2021, the analysed population consists of the fourteen (14) deposit money banks now trading on the Nigerian Exchange Group (NGX). Purposive sampling was used, and the sample size was set at 12 with reference to the number of years the banks had been in existence over the time frame of the study. Panel Regression Analysis, as an appropriate statistical method, will be incorporated into the inferential analyses as a result of the data's characteristics. This is due to the inferential nature of the analysis.

The panel regression analysis was conducted using the pooled ordinary least square (OLS) approach using random and fixed model effects estimates. The purpose of these calculations was to assess the statistical validity of the assumed connection between the dependent and independent variables. In panel data analysis, one way to check if a model is well specified is via the Fixed Effect Likelihood Ratio test. For the purpose of choosing between the pooled effect model and the fixed effects model, this test is employed. The probability of two models with the identical parameters is compared, thus the name of the test. The Langranger multiplier test distinguishes between the pooled effect model and the random effects model in panel data analysis. When deciding between the fixed effects model and the random effects model, the Hausman test is another model specification test to consider.

To check for a strong correlation between the independent variables that might introduce bias, the Multicollinearity test was performed. As a further diagnostic check, we looked at the robustness of the estimates with a Heteroskedasticity test. The purpose of both was to verify the stability of the estimations. After trying out several distinct approaches, it was determined that the Random Effect produced the best overall fit for the regression.

The study adapts the regression model as used by Bayelign & Ayalew (2022) & Arianpoor (2021).

Model:

$$SGR = \beta_0 + \beta_1 AIR + \beta_2 GDW + \beta_3 REVG + \epsilon_{it}$$

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Where:

SGR = Sustainable growth rate

AIR = Asset Intangibility Intensity

GDW = goodwill Intensity

REVG = Revenue Growth

β0 -β3 coefficients

ϵ_{it} = Stochastic Error term

Variable Measurement

Table 1

Variable	Description	Measurement
SGR	Sustainable Growth Rate	ROE (Return on Equity) x b (Retention Rate)
GDW	Goodwill Intensity	Goodwill divided by total asset
AIR	Asset Intangibility Intensity Rate	Goodwill plus Intangible asset divided by total asset
REVG	Revenue Growth	Total revenue of the year minus the previous year divided by total revenue of previous.

RESULTS AND DISCUSSION

In descriptive statistics, the mean, maximum, and lowest values of the applied variables are shown along with the corresponding standard deviations. The table below displays the descriptive "statistics for the study's variables.

Table 1: Descriptive Statistics Result

	SGR	AIR	GDW	REVG
Mean	5.289833	0.446250	0.001333	12.26658
Median	8.940000	0.230000	0.000000	10.96500
Maximum	28.08000	5.080000	0.040000	67.18000
Minimum	-394.3200	0.000000	0.000000	-65.94000
Std. Dev.	38.05457	0.824792	0.005175	19.35622
Skewness	-9.857311	4.081579	5.296020	0.180493
Kurtosis	103.2578	19.77653	34.99960	5.549988
Jarque-Bera	52201.43	1740.445	5680.828	33.16375
Probability	0.000000	0.000000	0.000000	0.000000
Sum	634.7800	53.55000	0.160000	1471.990
Sum Sq. Dev.	172329.9	80.95361	0.003187	44584.93
Observations	120	120	120	120

Source: E-view 10 Output, 2023

Table 1 provides descriptive information for the years 2012 through 2021 on the effect of investments in intangible assets on the long-term viability of Nigeria's deposit money institutions. The table shows that the sustainable growth rate (SGR), an indicator of a company's long-term viability, has a mean of 5.28983, a standard deviation of 38.05457, a minimum of -394.3200, and a high of 28.0800. Even though there was a considerable disparity between the lowest and maximum, the standard deviation indicated that the data did not deviate much from the mean value, indicating the company's continued viability. The table shows that the average intangible asset intensity (AIR) is 0.4462 and the average goodwill (GDW), the other measure of intangible asset investment, is 0.00133, with respective standard deviations of 0.8247 and 0.00517, minimum and maximum values of 0.0000 and 5.08000, respectively. Goodwill and intangible asset intensity were two of the most widely dispersed measures of intangible asset investment, although the large standard deviation relative to the mean and small range between minimum and maximum values reflect rapid expansion throughout the research period.

Table 2: Correlation Matrix

The correlation matrix table illustrates not only the correlation that exists between dependent and independent variables but also the correlation that exists between the independent variables themselves.

Correlation				
Probability	SGR	AIR	GDW	REVG
SGR	1.000000			
	—			
AIR	-0.083140	1.000000		
	0.3666	—		
GDW	0.005455	0.531000	1.000000	
	0.9528	0.0000	—	
REVG	-0.168698	0.039009	-0.060921	1.000000
	0.0655	0.6723	0.5086	—

Source: E-view 10 Output, 2023

The goal of the correlation analysis shown in table 4.2 is to examine the degree to which two continuous variables are related to one another (either as an independent and a dependent, or as two independents). One of the processes in conducting a correlation research is estimating a sample" correlation coefficient; in this case, we employ the Pearson Product Moment correlation coefficient. The sign of the correlation coefficient provides insight into the nature of the relationship. How closely the variables are linked is shown by the importance of the correlation coefficient. Using revenue as a control variable, the above result illustrates a positive and negative correlation between intangible asset intensity and goodwill. The sustainable growth rate serves as the dependent variable, and the corresponding correlations are -0.08314, -0.00545, and -0.16869.

Fixed Effect Likelihood Ratio Test

In panel data analysis, one way to check if a model is well specified is via the Fixed Effect Likelihood Ratio test. For the purpose of choosing between the pooled effect model and the fixed effects model, this test is employed. The probability of two models with the identical parameters is compared, "thus the name of the test. Due to the panel nature of the data, both pooled effect and fixed effect regressions were conducted. The best model was then chosen by conducting a test known as the fixed effect likelihood ratio specification test on both the pooled effects and fixed effect regression models. The major goal of the test was to find any associations between the error words and the regressors. Since the fixed effect likelihood ratio specification

choice rule has been established, the following holds at the 5% level of significance:

Table 3: Fixed Effect Likelihood Ratio

Effects Test	Statistic	d.f.	Prob.
Cross-section F	1.195427	(11,105)	0.2993
Cross-section Chi-square	14.159055	11	0.2243

Source: E-view 10 Output, 2023

The results of the test of the fixed effect likelihood ratio show a chi-square value of 14.1590 and probability values of 0.2243. This indicates that the pooled effect is a valid way for performing the Panel Regression investigation, which is consistent with the null hypothesis. This suggests that the estimator for the error component model, which pools individual observations, is the one to choose. One or more of the regressors are probably connected to the pooled effects. Given the alternatives of a pooled effect analysis and a fixed effect analysis, the fixed effect model of regression analysis is the most reliable and time-efficient estimate approach for the study. This is due to the widespread usage of the pooled effect model in regression analysis. Given the two alternatives mentioned above, the pooled effect regression model appears to be the best fit for the data sampled. This is shown by the likelihood ratio test statistics, which indicate a probability of more than 5%. The pooled effect regression model appears to be the best fit for the data in this sample, as indicated by the findings.

Langranger Multiplier Test

The langranger multiplier test is a test for model specification in panel data analysis and this test is employed to choose between pooled effect model and the random effects model.

Table 4: Breusch-Pagan Langranger Multiplier Test

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	188.7462	66	0.0000
Pesaran scaled LM	10.68369		0.0000
Pesaran CD	7.063384		0.0000

Source: E-view 10 Output, 2023

***Decision Rule: At 5% level of Significance**

H_0: Pooled Effect is more appropriate.

H_1: Random Effect is more appropriate.

The null hypothesis is rejected since the probability value of the Breusch-Pagan Langranger Multiplier Test is 0.0000. As a result, random effect is more appropriate than pooled effect in comparison to the results of this test.

Hausman Test

In panel data analysis, the Hausman test is utilised as a model specification test. The choice between a fixed-effects and a random-effects model is made with the help of this test. This study utilised both fixed effect and random effect regressions due to the panel nature of the data set. Then, between the fixed effect and the

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random effect regression models, the optimal choice was made using a Hausman specification test. The major goal of the test was to find any associations between the error words and the regressors. As a result, we now know the decision rule for the Hausman specification test; so, at" the 5% level of significance:

Table 5: Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.375414	3	0.9453

Source: E-view 10 Output, 2023

The chi-square statistic is 0.3754, and its related probability is 0.9453, according to the results "of the Hausman test. As a result, it appears that the random effect model is a viable option for the Panel Regression analysis and that the null hypothesis should be accepted. Given the strong correlation between the random effects and the regressors, it seems reasonable to conclude that the fixed-effect estimator provided by the error component model is not optimal. Therefore, the most reliable and precise estimation for the study comes from the random effect cross-sectional model. This supports the conclusion that the random effect regression model is most appropriate for the data set under consideration, as the corresponding probability value from the Hausman test statistics is more than 5%.

Multicollinearity Test (VIF)

The purpose of the multicollinearity test was to ascertain whether or not the independent variables are too closely related to one another and hence provide misleading results. The lack of multicollinearity in the collected dataset is strongly suggested by the moderate magnitude of the correlations between the independent variables. However, collinearity diagnostics tests using the variance inflation factor (VIF) were conducted to bolster the claim that multicollinearity was not an issue among the independent variables. You may find a summary of the collinearity diagnostics test findings in the table below:

Table 6: Multicollinearity Test (VIF)

	Coefficient	Uncentered	Centered
Variable	Variance	VIF	VIF
C	19.98457	1.674820	NA
AIR	24.80997	1.816719	1.402666
GDW	631653.9	1.499858	1.405749
REVG	0.032467	1.420330	1.010921

Source: E-view 10 Output, 2023

***Decision rule**: If the centred variance inflation factor (VIF) is less than 10, then multi-collinearity does not exist; if it is larger than 10, then multi-collinearity does exist.

Using the variance inflation factor, the following is the decision rule for the multicollinearity test: In the absence of multicollinearity, the centred variance inflation factor (centred VIF) is less than 10, whereas in the presence of multicollinearity, it is greater than 10. Based on the results of Table 6, it is clear that there is no multicollinearity among the independent variables (AIR, GDW, and REVG) since the centre VIF for each of the independent variables is less than 10.

Heteroskedasticity Test

To ensure the reliability of the estimates, a Heteroskedasticity test was performed. When the standard"

errors of a variable over time are not normally distributed, this is known as heteroskedasticity. Heteroskedasticity can compromise the reliability of any study since it contradicts the principles behind linear regression modelling. As a result of heteroskedasticity, the coefficient estimates are not biassed, but they are less accurate. When accuracy drops, it's more likely that "the estimated coefficients won't be as close to the true population value.

Table 7: Heteroskedasticity Test

	Value	df	Probability
Likelihood ratio	408.6957	12	0.0000
LR test summary:			
	Value	df	
Restricted LogL	-604.2433	116	
Unrestricted LogL	-399.8955	116	

Source: E-view 10 Output, 2023

The findings of the panel cross-section heteroskedasticity regression test is presented in Table 7. The following is an example of how to state the decision rule for the panel cross-section heteroskedasticity test:

*Decision Rule: At 5% level of Significance

H_0: No conditional Heteroskedasticity (Residuals are homoskedastic)

H_1: There is conditional Heteroskedasticity.

There is no heteroskedasticity, which is the null hypothesis, and there is heteroskedasticity, which is the alternative hypothesis. This study will employ the null hypothesis. The null hypothesis is to be rejected and the alternative hypothesis accepted if the P value is less than the 5% level of significance. Research suggests there is good reason to reject the null hypothesis and accept the alternative hypothesis, which asserts that there is a conditional Heteroskedasticity problem, based on the results presented in the table above, which show a ratio value of 408.6957 and the corresponding probability value of 0.0000, which is less than 5%. This is so because the ratio value exceeds the likelihood value by a large margin. Therefore, conditional heteroskedasticity exists, signifying that residuals are not homoscedastic, and the samples do not accurately represent the population (as indicated by the diagnostic probability of 0.0000, which leads to the rejection of the null hypothesis). Therefore, the dependent variable and the independent variables must be recorded in order to correct for heteroscedasticity.

Table 8: Panel Regression Result (Random Effect)

Dependent Variable: SGR				
Method: Panel EGLS (Cross-section random effects)				
Date: 01/18/23 Time: 04:24				
Sample: 2012 2021				
Periods included: 10				
Cross-sections included: 12				
Total panel (balanced) observations: 120				
Swamy and Arora estimator of component variances				
Variable	Coefficient	Std. Error	t-Statistic	Prob.

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C	-4.140561	0.768355	-5.388862	0.0000
AIR	-0.145389	0.339205	-0.428617	0.6691
GDW	-27.82579	43.06831	-0.646085	0.0196
REVG	0.005128	0.009951	0.515304	0.6074
LOGSGR	6.605221	0.316951	20.83989	0.0000
	Effects Specification			
			S.D.	Rho
Cross-section random			1.165841	0.2976
Idiosyncratic random			1.791140	0.7024
	Weighted Statistics			
R-squared	0.805426	Mean dependent var		4.378985
Adjusted R-squared	0.798220	S.D. dependent var		4.041596
S.E. of regression	1.821232	Sum squared resid		358.2236
F-statistic	111.7647	Durbin-Watson stat		1.524913
Prob(F-statistic)	0.000000			

Source: E-view 10 Output, 2023

This research set out to learn how intangible asset investment affects the bottom lines of Nigeria's deposit money institutions. The regression model shows that the range of values for adjusted R2 and R2 is between 79% and 80%, as shown in table 8. The coefficient of multiple determinations (R2) is 0.8054. The panel nature of the data utilised in this inquiry is consistent with this conclusion, and this finding is reinforced by the fact that the panel nature of the data was taken into account. This indicates that differences in the independent variables (AIR, GDW, and REVG) account for around 80% of the overall variance in sustainable growth rate (SGR), while the error term accounts for the remaining 20%. Because of this, it's likely that the line of best fit is rather precise. In the table above, we can see the panel regression result for the sampled deposit money bank, which indicates a negative correlation between intangibility asset and sustainable growth rate, with a probability value of 0.6691 (more than or equal to 5%). Since there is a statistically significant relationship between the two variables, this result follows. A positive probability value of 0.0196, or less than 5%, is associated with goodwill. This suggests that the connection is weak. The F-statistic is 111.7647S and the probability of the F-statistic is 0.00000 when the regressors (AIR and GDW) are tested against the" regressed (SGR). This means that the regressors have a noteworthy impact on the dependent variable. Positive and statistically significant (at the 5% level) total regression may be inferred from this result.

DISCUSSION OF FINDINGS

This research looked at how Nigerian deposit money banks fared after factoring in the impact "of intangible asset investments on their long-term health. Listed deposit money banks in Nigeria were examined to see how goodwill and intangible assets affect the long-term growth rate of these institutions. Models, hypotheses, and analyses were built to support the study's findings. Goodwill and other intangible assets are characterised in this study as intangible asset investments, and they are found to have a significant influence on the long-term growth rate of Nigeria's publicly traded deposit money institutions. However, the findings of this study are compared to those of previous research.

An examination of the connection between intangible asset investment and company sustainability (proxied by intangibility asset) reveals a negative effect of intangible assets on the sustainable growth rate of listed deposit money banks in Nigeria. These findings are in line with those of Okoye et al. (2019), who discovered proof of a positive association between intangible assets and sustainable" growth, but at odds with those of Ionita & Dinu (2021). Second, a positive and statistically significant effect of goodwill on the rate of sustainable development of listed deposit money banks in Nigeria was found in a recent research. The findings did corroborate those of Rastic et al. (2021), who found that a company's rate of sustainable growth is correlated with its goodwill.

CONCLUSION AND RECOMMENDATIONS

The study was basically undertaken to examine the intangible asset investment on business sustainability of deposit money banks in Nigeria from 2012-2021 in Nigeria. The result revealed that goodwill intensity has a positive significant effect on the sustainable growth rate while asset intangibility intensity has a negative effect on the sustainable growth rate of deposit money banks in Nigeria. The study further shows that intangible asset investment has a significant effect on business sustainability of deposit money banks in Nigeria. The findings validate the knowledge-based theory as knowledge is considered the key driver of Intangible assets. Therefore, the study concluded that intangible asset investment has a significant effect on business sustainability of deposit money banks in Nigeria. Based on the findings of this study and the conclusion made, the following recommendations are made to the management of deposit money banks in Nigeria:

1. Management of deposit money banks should strategically monitor its Asset Intangibility Intensity because of its negative effect on the strategic growth rate of the bank.
2. Goodwill should be maintained, and deposit money banks should still invest more in intangible assets for sustained business growth.

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