INNOVATION AND COMPETITIVE ADVANTAGE IN NIGERIA'S DEREGULATED DOWNSTREAM SECTOR OF OIL AND GAS INDUSTRY

By

IFERE, S. E. & ANYAOGU, S. O.
University of Lagos Business School (ULBS), University of Lagos,
Lagos, Nigeria
sifere@unilag.edu.ng & umuoma2@yahoo.com

Abstract
The Deregulation of Nigeria's Downstream sector has given birth to a new era of opportunities and challenges for the oil and gas industry in the country. This paper explores the relationship between innovation and competitive advantage in Nigeria's deregulated downstream oil and gas sector. The study adopted survey research design and used questionnaire to generate data from 81 senior management employees of twenty downstream companies operating in Lagos. Descriptive statistics of means and standard deviations were used to identify the relationship between the independent and dependent variables on the basis of key players' opinion. The study shows a positive relationship between process innovation, marketing innovation and business model innovation and competitive advantage, with marketing innovation indicating the strongest effect. This outcome suggest that the adoption of process innovation, marketing innovation, and business model innovation can significantly boost the performance of firms operating in Nigeria's downstream oil and gas subsector under deregulation and generate competitive advantage. The study therefore recommends that firms operating in the sector, under the deregulation regime, should foster a culture of innovation and prioritise marketing innovation, in addition to process innovation and business model innovation, to enable them generates competitive advantage.
Keywords: *Deregulation, competitive advantage, process innovation, marketing innovation, business process innovation*

1 Introduction

The deregulation of Nigeria's downstream sector marks a watershed moment in the country's oil and gas industry, heralding a new era of possibilities and challenges. In this emerging dynamic landscape, the interplay between innovation and competitive advantage is likely to emerge as a pivotal determinant of success, shaping the trajectory of companies striving to thrive within the newly deregulated environment. Porter (1985) notes that competitive advantage encapsulates the essence of what sets a company apart - be it in terms of cost leadership, differentiation, or focus – thus positioning it ahead of competitors and enhancing its long-term sustainability.

The downstream sector of the oil and gas industry encompasses the activities involved in the supply and distribution of petroleum products, including refining, storage, transportation, and marketing.

The deregulation of Nigeria's downstream sector, which began in the early 2000s, aimed to enhance efficiency, attract investments, and promote competition in the market (Nkogbu & Okorodudu, 2015). Prior to deregulation according to Ifere (2015), the sector was highly regulated, with the government controlling key aspects such as pricing, importation, storage, and distribution of petroleum products. However, recognizing the need for market-driven reforms and the limitations of a state-controlled system, the Nigerian government started the process of deregulation in the early 2000s (Ifere, 2015).

The decision to deregulate the downstream sector was driven by several factors. Firstly, the government aimed to attract private investments and encourage competition within the sector. By allowing private players to enter the market, it was believed that increased competition would foster efficiency, innovation, improved service delivery and profitability (Ifere, 2011). Additionally, deregulation was seen as a means to reduce the burden on government finances by removing subsidies and shifting the responsibility of pricing to market forces (Yusuf, 2023).

Over the years, the Nigerian government implemented several policy measures to support deregulation and attract private investments. These measures included the liberalization of the downstream sector in

2002, the licensing of private refineries, and the removal of barriers to entry for independent marketers. The government also introduced reforms to enhance transparency, improve governance, and combat corruption within the sector.

The deregulation of the downstream sector in Nigeria has had both positive and challenging implications. On the positive side, deregulation is encouraging competition, leading to improved service delivery, product availability, and operational efficiency. It will also create opportunities for technological advancements, innovation, and the development of a vibrant downstream industry.

However, the deregulation process has not been without challenges. One of the key challenges has been the volatility of petroleum product prices. Fluctuations in international crude oil prices and exchange rates are impacting the cost of imported products, leading to price variations in the domestic market and low demand.

Furthermore, the removal of subsidies on petroleum products has been a contentious issue. While subsidies were originally intended to provide affordable fuel prices to the populace, they also caused significant fiscal burdens on the government. The removal of subsidies is aimed at redirecting the savings to critical sectors such as infrastructure, education, and healthcare (Izuaka, 2023). However, the removal of subsidies has been met with public resistance due to concerns over increased fuel prices and the impact on the cost of living.

The historical context of downstream sector deregulation sets the stage for understanding the significance of innovation and competitive advantage within Nigeria's evolving downstream industry.

As the downstream sector adapts to the post-deregulation landscape, industry participants grapple with a central challenge: how to harness innovation to gain a distinct competitive edge. Amidst intensified competition, evolving customer preferences, and fluctuating market dynamics, organizations must strategically deploy innovation to not only survive but thrive. The complex interplay between innovation drivers, mechanisms, and outcomes necessitates an in-depth exploration to unearth strategies that can position companies at the forefront of this newly deregulated market. The originality of this study is based on the fact that despite the avalanche of studies on various aspects of deregulation of the downstream sector (Ifere, 2011, Akinyele 2011, Anyadike 2013, Ogwo and Onuoha 2013; Ezie and Beida 2014; Ifere, 2015; Nkogbu and Okorodudu, 2015; Kadiri and Lawal, 2016; Owoeye and Adetoye, 2016; Arokodare, Makinde and Fakunmoju, 2020; Olusola, 2021 and Oyakhire and Akpan, 2021) there is however no known study that sought to investigate the relationship between innovation and competition advantage in the Nigeria's deregulated downstream since it was fully deregulated in 2021. This study aimed at exploring the relationship between innovation and competitive advantage in Nigeria's deregulated downstream sector of the Oil and Gas Industry. The significance of this study lies in its potential to unravel the nuances of innovation in the deregulated downstream sector of Nigeria. As organizations grapple with the demands of a competitive marketplace, understanding how innovation can be harnessed to establish and maintain a competitive advantage becomes paramount. The paper therefore seeks to achieve these objectives: (i) to explore the relationship between process innovation and competitive advantage of firms in Nigeria's deregulated downstream sector. (ii) to examine the effect of marketing innovation on competitive advantage of firms in Nigeria's deregulated downstream sector. (iii) to examine the effects of business model innovation competitive advantage of firms in Nigeria's deregulated downstream sector. Drawing from the objectives, the study will seek to answer these research questions: (i) what is the relationship between process innovation and competitive advantage of firms in Nigeria's deregulated downstream sector? (ii) How does marketing innovation affect competitive advantage of firms in Nigeria's deregulated downstream sector deregulated downstream sector? (iii) What is the effect of business model innovation on competitive advantage of firms in Nigeria's deregulated downstream sector?

2 Literature Review

Conceptual Review

This conceptual review categorizes and defines concepts and variables relevant to the study and outline a relationship between them. This conceptual review therefore explains the variables in the study, namely, Innovation, process innovation, marketing innovation, business model innovation and Competitive Advantage.

Innovation

Burns (2022) describes innovation as "something of a holy grail to be sought after and encouraged." He sees it as vital to a firm's market entry, growth, and survival and the way any industry can change over time. Bouchard and Fayolle (2018) defined Innovation as the process of turning an idea into a valuable product or service that consumers are willing to embrace and/or pay for. According to Whittington et al. (2020), any firm that wants to continuously develop new products, services, or processes and so successfully compete must innovate constantly.

Urabe (1988) says that some scholars define Innovation as coming up with a new idea and turning it into new products or services that help the economy of a country grow quickly, create more jobs, and make money for the company.

Aladejebi (2022) posits that companies are taking to Innovation to ensure they survive, seize opportunities, and resist threats in the ever-unpredictable business environment. In the words of Agolla and Van-Lill (2014), companies need to be not only active but proactive in adopting creative approaches to providing goods and services that have unique values for their customers in order to remain competitive and sustain economic growth and development.

Dimensions of Innovation

Innovation can happen in many dimensions (Nolan, 2016). Sawhney, Wolcott, and Arroniz (2006) developed what they called the "innovation radar" which identified 12 dimensions of innovation based on four business anchors, namely the offerings a firm creates, the customers it serves, the processes it employs and the points of presence it uses to take its products/services to the market. They embedded 8 other dimensions between these anchors. Nolan (2016) and Morris (2013) added one more dimension to bring the dimensions to thirteen. The thirteen dimensions of the business system which can serve as avenues of innovation are: Product/Services, customers, processes, platform, solutions, customer experience, presence, value capture, supply chain, networking, Brand, Organization and Business model.

Odukoya, Omonijo, Mistra, and Ahuja (2019) added technological innovations which encompass advancements in automation, digitalization, and Internet of Things (IoT) applications.

This study focused on three aspects of innovation namely, processes, business Model, and marketing innovations by examining how they lead to competitive advantage of companies in Nigeria's deregulated downstream sector of the Oil and Gas Industry.

Process Innovation

Process innovation according to Sawhney et al (2006), Hertle (2007) and Nolan (2016), is the redesigning of the business processes to achieve greater efficiency, higher quality, and faster cycle time. The benefits as noted by Sawhney et al. (2006) are flexibility and speed to market coupled with the freedom to redirect resources to core strategic activities.

The most typical rationale for utilizing process innovation is rivalry within the same industry. Process innovation could impede rivals by providing the organization with operational advantages such as cost efficiency, delivery speed, and quality consistency (Pisano, 1997). Reichstein and Salter (2006) concur that applying process improvements may lead to competitive advantages, and that innovation is an essential source of higher productivity.

Wheelwright (2010) identifies four categories of advantages associated with good process development activities. The first benefit is market position, which means that the company may define the industry standard, which creates a barrier to rivals. The second advantage is the use of new technologies, which allow the company to overcome previous limitations and the process to reach its full potential. This is known as resource utilization. The third advantage, which is organizational renewal and transformation, emphasizes organizational benefits. Positive process results capture the entire organization's devotion, ingenuity, and creativity. Furthermore, it stimulates fresh thinking and improves the organization's potential to attract the finest personnel. A fourth advantage is the ability to either accelerate time to market, which offers a competitive advantage, or postpone development to gather more knowledge in order to bring goods to market that are better suited to the customers.

i. Business Model Innovation

Joubert (2020) defines a business model as a plan or document that specifies how a company will meet the needs of its customers. It often describes the market the company intends to serve, the requirements of that market, and the part the company's products or services will play in satisfying those needs. Business model innovation according to Joubert (2020), is the method through which an organization makes changes to its business model. The innovation most times represents a significant shift in the

way the organization generates and distributes income or provides products or services to its customers. In the views of Kalu and Onuoha (2023), business model innovation constitutes a radical departure from conventional industrial practice. Companies do this through catering to the needs of untapped markets by introducing new products or services, improving current ones, or creating value for clients in unconventional ways.

Among its numerous benefits, Kalu and Onuoha (2023) point out that the Business Model lays out a blueprint for how a group of companies might collaborate to produce and profit from technological advancements. Therefore, the business model is a robust and strategic framework for transparently explaining, through narrative and data, the mechanics of an existing company, the expected results of an alternative business model, the factors that determine a company's success or failure, and the best approaches to exploit digital technologies. According to Geroni (2021), the relevance of business model innovation outweighs the value of product or process level innovation by a wide margin since it has the ability to generate substantial consumer advantages while also providing credible and distinctive selling propositions. While innovation in products and services is crucial, Deimler and Kachaner (2023) argue that business model innovation can provide a more sustainable competitive edge especially during times of disruption.

ii Marketing Innovation

Purchase and Volery (2020) define marketing innovation as the use of new marketing approaches and procedures that differ from earlier ones and entail major changes in product or service promotion, design, packaging, and placement, pointing out that it aids in the improvement of a product or service and the reach of a larger customer base. Ungerman and Dedkova (2019) see marketing innovation as a company's proficiency in approaching the market, successfully use the channels of communication, and deliver product and service to control prospective or current clients. It involves all new techniques and strategies used to improve sales and market share which includes identifying new market opportunities, understanding customer needs and preferences, and developing innovative solutions to meet those needs.

One of the key benefits of marketing innovation is that it can help companies differentiate themselves from competitors and create a competitive advantage. By developing unique and innovative marketing strategies, companies can attract new customers, retain existing ones, and increase market share. Marketing innovation can also help companies respond to changes in the market, such as shifts in consumer preferences or emerging trends (Casio, 2011).

However, marketing innovation also presents challenges, such as the need for significant investment in research and development, the risk of failure, and the need for continuous adaptation to changing market conditions. To overcome these challenges, companies need to foster a culture of innovation, encourage experimentation, and embrace a willingness to take risks (Ungerman & Dedkova, 2019).

Successful marketing innovation requires a deep understanding of customer needs and preferences, as well as the ability to develop and implement effective marketing strategies that resonate with target audiences. It also requires a commitment to ongoing learning and development, as well as a willingness to adapt to changing market conditions and emerging trends (Cascio, 2011).

Marketing innovation is therefore essential for companies to stay competitive and create value for customers in today's rapidly changing business environment. By developing innovative marketing strategies, companies can differentiate themselves from competitors, attract new customers, and increase market share. However, marketing innovation also presents challenges, and companies need to foster a culture of innovation and embrace a willingness to take risks to succeed (Cascio,2011).

Competitive Advantage

Competitive advantage, a cornerstone concept in strategic management, underpins the success and longevity of organizations across industries. According to Porter (1985) competitive advantage occurs when a company obtains or develops a trait or combination of attributes that allows it to outperform its competitors. The notion of competitive advantage has evolved over the years to encompass a broad spectrum of strategies, resources, and capabilities that enable firms to outperform their rivals. Christensen (2010) views it as the value a company creates that is difficult to imitate and which makes customers to prefer its products/services over those of its competitors. Porter (1985) sees innovation as a product of value that a company creates for its customers that exceeds the cost of producing that value. Nkuda (2017) defines it as an advantage that a company has over its rivals which is evaluated based on acceptable performance measures which could be either financial, non-financial or both. Grant (2022)

sees competitive advantage as a company's ability to earn a higher rate of profit than its direct rivals. For Whittington et al (2022), it is about how an organization creates value for its users both greater than the costs of supplying them and superior to that of rivals.

Grant (2022) identifies two major sources of Competitive Advantage: namely, External and Internal sources. External sources according to him are external changes like COVID-19 pandemic of 2020. In the view of Grant (2022), the more an industry is buffeted by external change and the greater the difference in the strategic positioning of firms in the industry, the greater the dispersion of profitability among firms. A company's competitive advantage from external changes depends on its ability to anticipate the external changes and the capacity to give quick response when they occur. Chankim and Manborgne (2015) point out that internal sources are innovation through Business models, which involves the introduction of new approaches to create and or capture value within an in industry and Blue Ocean strategy, which has to do with creating uncontested market space and creating new demand

Determinants of competitive advantage

The determinants of competitive advantage deal with factors or elements that contribute to a firm's ability to outperform competitors and achieve sustainable success in the marketplace. Bralina et al (2012), Twin (2023), and Chang et al (2021) have identified several determinants/drivers of competitive advantage which include, the ability to develop new ideas, business model, supply chain, marketing technics that provide competitive edge and drive growth; a strong brand image and positive reputation that can create customers loyalty, trust and preference; having strong distribution channels that provide access to key markets etc.

Theoretical Review

The integration of innovation as a driver of competitive advantage is informed by several theoretical perspectives, each contributing to a nuanced understanding of how companies can effectively leverage innovation to secure a sustainable edge in a deregulated market. This study is underpinned by the Resource-based theory and Dynamic Capability theory.

Resource-Based View (RBV)

The Resource-Based View (RBV) by Barney (1991), emphasizes that a firm's competitive advantage is derived from its unique and valuable resources and capabilities. The theory has been widely applied to assert that innovation, as a unique and valuable resource, can confer sustainable competitive advantage. When applied to the downstream sector in Nigeria, companies must identify and leverage their distinct innovation-related resources, such as technology, processes, products, knowledge, and intellectual property, to gain a sustainable competitive advantage. Firms that can continuously innovate and develop new capabilities can achieve superior performance in the deregulated market.

Dynamic Capabilities Theory

The Dynamic Capabilities Theory by Teece, Pisano and Shuen (1997) posits that organizations need to be adaptable and possess dynamic capabilities to respond effectively to changing market conditions and seize opportunities for innovation. In the deregulated downstream sector, innovation becomes a dynamic capability, enabling companies to swiftly adapt to evolving consumer demands, regulatory shifts, and technological advancements. Organizations that cultivate a culture of innovation are better equipped to seize emerging opportunities and address challenges, contributing to a sustained competitive advantage.

Theoretical frameworks play a crucial role in understanding the complex relationship between innovation and competitive advantage in Nigeria's deregulated downstream sector. The Resource-Based View emphasizes the role of unique resources, while the Dynamic Capabilities theory highlights adaptability and responsiveness to change. By integrating insights from these theories, policymakers and business leaders can devise effective strategies to foster innovation, strengthen competitive advantage, and propel the growth of the deregulated downstream sector in Nigeria.

Empirical Literature on innovation and competitive advantage

This empirical review examines empirical studies on the relationship between innovation and competitive advantage. There is consensus view among many researchers that innovation leads to competitive advantage and sustainability of companies and organizations in all sectors.

Ifere et al. (2022) conducted a study on how local companies mobilize their innovative capabilities to respond to existing infrastructure and market constraints. Using qualitative inductive approach, they found that companies deployed various aspects of innovations, such as process innovations, technological innovations and business model innovations to remain in business.

Santa, Hyland and Ferrer (2014) in their study on technological innovation and operational effectiveness: their role in achieving performance improvement, found that the dimensions coming from technological innovation effectiveness such as system quality, information quality, service quality, user satisfaction and the performance objectives as a result of operational effectiveness such as cost, quality, reliability, flexibility and speed are important and significantly well-corrected factors. The study also noted that these factors promote the alignment between technological innovation effectiveness and operational effectiveness and concluded that there is a significant and direct influence of this alignment on the improvement of operational performance. Mugo (2020) investigated the effect of process innovation on the competitive advantage of the telecommunication industry in Kenya. The study which adopted a descriptive research design using a sample size of 26 active telecommunication companies in Kenya found that process innovation has a significant effect on the competitive advantage of telecommunication companies in Kenya.

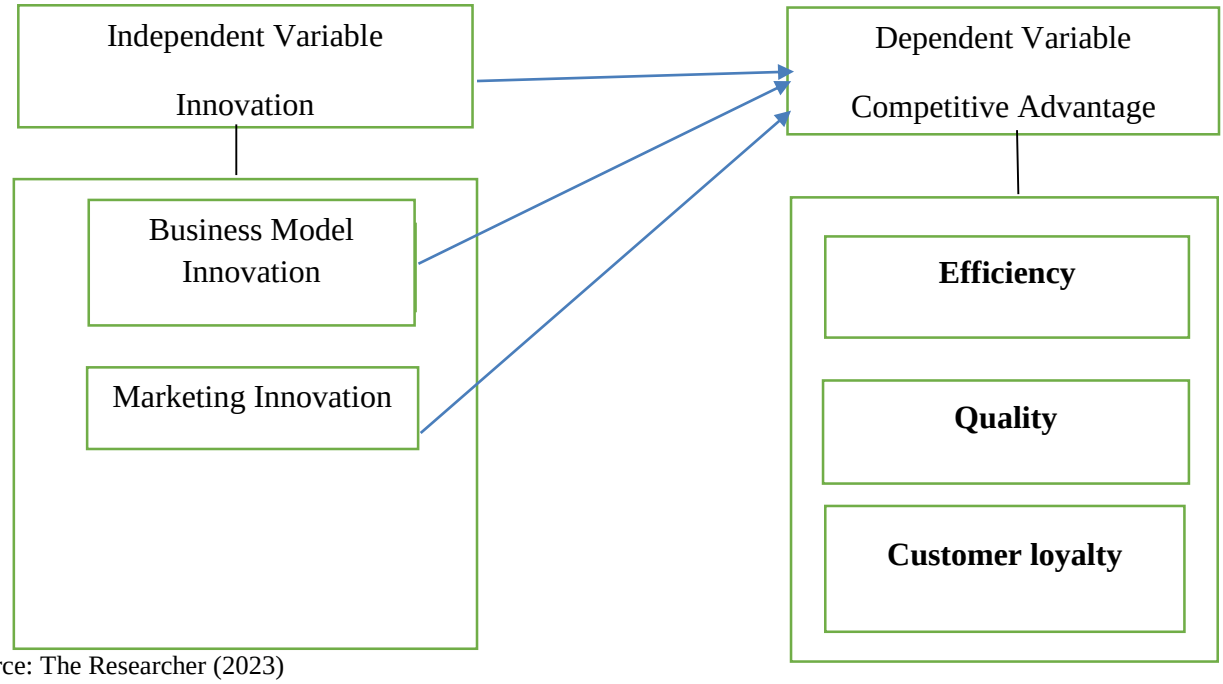
Enyia and Nwuche (2020) in their work, Innovation: a catalyst for effective engagement and economic growth in challenging times, examined the role of innovation in bringing about effective engagement and economic growth in challenging times and found out that innovation has a significant relationship with both effective engagement and economic growth. They, therefore, recommended conscious effort of all stakeholders to encourage innovation in all sectors of the economy.

A study by Peng, Qin and Tang (2021) on the influence of marketing innovation on firm performance under different market environments: evidence from China, noted that the adoption of marketing innovations can contribute to the sustainability of a company. The result of their study revealed that marketing innovation significantly contribute to the performance of a company. Dajah and AIshora (2022) noted in their work; the impact of innovative marketing on competitive advantage in renewable energy companies in Jordan that innovative marketing enhances marketing processes and creates added value for companies in the marketing and promotion of their products or services. Using descriptive, analytical, and heuristic research methods, they found a statistically significant impact of innovative marketing on the competitive advantage of the renewable energy companies in Jordan. Furthermore, Efrata et al. (2019) support the role of marketing innovation to gain competitive advantage. In their study on the impact of innovation, competitive advantage, and market orientation on a firm's marketing performance in the garment industry in Indonesia, they discovered that marketing innovation affect marketing performance of a firm. Epetimehin (2011) asserted that companies must continuously seek for the development of their products and services through marketing innovation and creativity in other to achieve continuous profitable performance to stakeholders. This according to him is a key role in achieving competitive advantage. In his study on achieving competitive advantage in insurance industry: the impact of marketing innovation and creativity, it was discovered that marketing innovation and creativity are crucial in the success of companies and through them, the insurance industry can improve their businesses and achieve competitive advantage.

Kalu and Onuoha (2023) investigated the relationship between business model innovation and competitive advantage of manufacturing companies in Rivers state and found that the dimension of business model innovation has a significant positive relationship with differentiation and organizational responsiveness. They concluded that business model innovation will help improve the competitive advantage of manufacturing companies. In their work on business model innovation and firm performance, Latifi et al (2023) applied structural equation modelling to analyse the data collected and found that there are significant direct effects from efficiency growth, organizational capabilities, and revenue growth on company performance. This according to them confirms the validity of the business model innovation in driving a firm's competitive advantage.

In summary, the empirical literature underscores the centrality of innovation in achieving and sustaining competitive advantage. Drawing upon diverse theoretical perspectives, the review illuminates the multifaceted dimensions of innovation, its impact on competitive advantage dynamics, and the factors influencing its successful adoption. As the downstream sector navigates the challenges and opportunities of deregulation, the synthesis of these insights sets the stage for empirical investigation and practical strategies for leveraging innovation to secure a distinct market position.

Model of the study



Source: The Researcher (2023)

The above model explicates the assumed relation between the independent and dependent variables. Innovation is multidimensional construct encompassing process innovation, marketing innovation, and business model innovation. Each of these dimensions is assumed to have effect on the three elements (efficiency, quality and customer satisfaction) of competitive advantage.

3 Methodology

The study followed quantitative survey research approach which according to Berman and Sauder, (2008) depends on samples of a given population and relies strongly on numerical data and statistical analysis in determining the relationship between the dependent and independent variables of a study.

The population of the study consists of 20 purposively selected companies from the downstream sector of Nigeria's Oil and Gas industry, with headquarters in Lagos and with not less than 2% of the market share. The number of senior management members in each of the companies is typically 8. This yields a population of 160. A sample size 30% is considered adequate for a population under 1,000 (Nardi, 2003). Five (5) senior management members were selected by simple random sampling from each of the companies for the exercise, and 81 usable returns were received, which represent 51%. Simple random sampling was adopted to ensure unbiased representation of the population. One of the authors is a senior management member of one of the companies in the sector and he assisted in collecting the data. The respondents were assured that the data will be treated anonymously and used for academic purpose only in other to minimise bias. Senior management members of the companies were purposively selected as respondents because they are in a position to understand the effects of innovation on competitive advantage of their firms.

A structured 5-point Likert scale questionnaire was used as instrument to generate the data.

The questionnaire was adapted to google form, and the link was sent online to the respondents. This was done to ease the process of data collection and facilitate direct response from the respondents. There was follow up on respondents through emails and telephone calls and the number of questionnaires that were returned and found useful were 81, representing 81% useful rate of return.

The items in the questionnaire sought to explore the relationship between innovation and competitive advantage Nigeria's deregulated downstream sector of the Oil and Gas industry. The coding of the questionnaire items ranged from 1=Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly agree. Four (4) items were used for measurement of the effect of elements of the independent variable (IV) on the dependent variable (DV). The items were designed to elicit response on positive effect of the three innovation approaches on competitive advantage of firms within the downstream sector of the Oil and Gas Industry. Descriptive statistics (mean and standard deviation) were used to

analyse the data. The use of standard deviation in addition to the mean is appropriate for the study as the standard deviation indicates the extent to which the mean measures convergence of respondents' opinion about the study variables.

4 Results

Table 1. Descriptive Statistics of the research variables.

Item	N	Mean	Std. Deviation
Research Question 1 Effect of process innovation on competitive advantage	81	4.24	0.85
Research question 2: Effect of Marketing Innovation on competitive advantage.	81	4.33	0.68
Research Question 3: Effect of Business Model Innovation and competitive advantage.	81	4.19	0.75

Source: Field survey 2023

Research question 1

Table 1 indicates a mean of means of 4.24 and a standard deviation of 0.85 with respect to the effect of process innovation on competitive advantage of the firms in the Oil and Gas downstream sector. For a Likert scale ranging from 1 (Strongly Disagree) to 3 (Neutral), and 5 (Strongly Agree), the result indicates that process innovation has positive effect on performance of firms. In particular, the standard deviation of 0.85 is relatively small, being less than half of the mean, which suggests that the observed data points are clustered closely around the mean, indicating a reliable representation of the data and relatively small variation (Field, 2013).

Research question 2

Table 1 also indicates a mean of means of 4.33 and a standard deviation of 0.68 with respect to the effect of marketing innovation on competitive advantage of firms in Nigeria's Oil and Gas downstream sector. For a Likert scale ranging from 1 (Strongly Disagree) to 3 (Neutral), and 5 (Strongly Agree), the result indicate strong emphasis that marketing innovation has a positive effect on competitive advantage of firms. The standard deviation of 0.68 indicates that the deviation of individual respondents' opinions from the mean is minimal, and less than half of the mean. This also suggest that the observed data points are clustered closely around the mean, indicating a reliable representation of the data.

Research question 3

Table 1 shows a mean of means of 4.19 and a standard deviation of 0.75 with respect to the effect of business model innovation on competitive advantage of firms in the Oil and Gas downstream sector. For a Likert scale ranging from 1 (Strongly Disagree) to 3 (Neutral), and 5 (Strongly Agree), the result indicate that business model innovation has a moderate positive effect on competitive advantage of the firms. The standard deviation of 0.75 indicates that the deviation of individual respondents' opinions from the mean is minimal.

Taken together, the three results suggest that innovation is a strong element of competitive advantage for firms in Nigeria's Oil and Gas downstream sector, with marketing innovation (4.33) indicating the strongest effect, followed by process innovation (4.24), and then business model innovation (4.19).

Discussion of Results

The objective of this study was to explore the relationship between innovation and competitive advantage in Nigeria's deregulated downstream sector of the Oil and Gas Industry, using three innovation approaches (process innovation, marketing innovation and business model innovation) as elements of the independent variable.

The result indicates that process innovation significantly leads to efficiency and cost reduction for firms operating in the Nigeria's deregulated downstream sector of the petroleum industry. The finding of this study is consistent with the findings of Ifere et al (2022) who studied how local companies mobilize their innovative capabilities to respond to infrastructure and market constraints and found that process innovation was one of the various aspects of innovations deployed by companies to remain in competitive. The result is also consistent with the findings of Mugo (2020) who studied process

innovation and competitive advantage in telecommunication companies and found that process innovation statistically affects the competitive advantage of telecommunication companies in Kenya. Furthermore, the outcome of the study is consistent with the findings of Peng, Qin and Tang (2021) who studied the influence of marketing innovation on company performance under different market environment and found that marketing innovation significantly contributes to performance of a company as well as the findings of Dajah and Alshora (2020) who studied the impact of innovative marketing on completive advantage in renewable energy companies and found a statically significant impact of innovative marketing on competitive advantage of the renewable energy companies in Jordan. The results also corroborate the conclusion of Kalu and Onuoha (2023) who investigated the relationship between business model innovation and competitive advantage of manufacturing companies in Rivers state and concluded that business model innovation has a significant positive relation with differentiation and organizational responsiveness and will help to improve the competitive advantage of manufacturing companies.

5 Conclusion, Recommendations, Limitations and Suggestion for further Studies

Conclusion

The study was undertaken to examine how process innovation, marketing innovation and business model innovation affect competitive advantage of firms operating under deregulation of the downstream sector of Nigeria's oil and gas industry.

The outcome of this study indicates that the adoption of process innovation, marketing innovation, and business model innovation can significantly boost the performance of firms operating in Nigeria's downstream oil and gas subsector under deregulation and generate competitive advantage. Firms that prioritise marketing innovation, in addition to process innovation and business model innovation, will likely have competitive advantage over those that do not, in a free market.

Recommendations

The results of this study underscore the importance of innovation in the downstream sector of Nigeria's oil and gas industry under deregulation. The study therefore recommends that firms operating in the sector, under the deregulation regime, should foster a culture of innovation to stay competitive. In particular, the study recommends that the firms should prioritise marketing innovation, in addition to process innovation and business model innovation, to enable them generates competitive advantage.

Limitations

The use of respondents' opinion might be subject to bias but this is expected to be minimized by the assurance of anonymity and exclusive use of the information for academic purpose only.

Suggestions for Further Studies

Future studies should consider mixed method approach to gather rich, detailed insights from industry stakeholders, including managers and employees. This would allow researchers to explore the nuanced perceptions and experiences related to innovation and competitive advantage that quantitative methods alone may overlook. Longitudinal studies tracking industry evolution over time would offer vibrant perspectives, highlighting the long-term effect of innovation, and competitive advantage of firms operating in the downstream subsector.

References

Adekunle, Y., & Amos, T. (2018). Strategic innovation and competitive advantage in Nigeria's downstream petroleum industry: The role of technology adoption. *International Journal of Engineering Research and Management, 5*(5), 1-10.

Adeola, F., & Alabi, O. (2019). Enhancing competitive advantage through innovation in the Nigerian downstream petroleum industry. *International Journal of Social Sciences and Humanities Reviews, 9(3), 81-92.*

Adeoye, T., & Amoo, S. (2020). Innovation and competitive advantage in the Nigerian downstream oil and gas industry. *International Journal of Engineering Research and Management, 7*(3), 78-87.

Adeoye, T., Aderemi, H., & Olumuyiwa, A. (2020). Fostering innovation and competitive advantage in the Nigerian downstream oil and gas industry: The role of strategic alliances. *Journal of Entrepreneurship and Business Innovation, 7*(2*), 32-50.*

Agolla, J. E., & Van-Lill, J. (2014). Assessment of innovation in public sector organizations in Kenya. Retrieved from *https://www.researchgate.net/publication/309576703*

Akande, A. O., & Sanni, A. (2016). Competitive advantage and innovation in the Nigerian downstream oil and gas sector. *International Journal of Innovation and Economic Development, 2*(3), 47-55.

Akinyele, S. T. (2011). Strategic marketing and firms' performance: A study of Nigerian oil and gas industry. *Business Intelligence Journal 4*(2), 303-311.

Aladejebi, O. (2022). Evaluating the level of Intrapreneurship among firms in Lagos, Nigeria. *University of Lagos Business School Journal, 1*(1), 89-104.

Aluko, O. (2014). Competitive advantage and firm performance in the Nigerian downstream oil sector. *International Journal of Business and Management, 9*(1), 74-85

Anyadike, N. O. (2013). Assessment of the implication of full-scale deregulation of the downstream oil sector on the Nigerian economy: The neoliberalism approach. *Global Journal of Political Science and Administration. 1*(2), 23-48.

Ayala, R. A. (2018). Thinking of conceptual reviews and systematic reviews. Retrieved from *Wileyonlinelibrary.com/journal/nin. DOI:10.1111/nin.12264*

Ayedun, C. A., & Oluwadare, O. J. (2019). Strategic alliances as a catalyst for innovation and competitive advantage in Nigeria's downstream oil and gas industry. *Global Journal of Social Sciences Studies, 5*(1), 89-99.

Ayedun, C. A., & Olumuyiwa, A. S. (2020). Technological innovation and competitive advantage in Nigeria's downstream oil and gas sector. *International Journal of Economics, Commerce and Management, 8*(3), 57-69.

Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17*(1), 99-120.

Berman, R., & Saunder, M. (2008). *Dealing with statistics: What you need to know*. Maidenhead*: Mcgraw-Hill Open University Press.*

Bouchard, V., & Fayolle, A. (2018). *Corporate entrepreneurship.* Abingdon, Oxon: Routledge.

Braslina, L., Viksne, K., Cumakovs, A. (2014). Innovative competitive advantage determination Model. Retrieved from https://api.semanticscholar.org/CorpusID:168670857

Burn, P. (2022). *Corporate entrepreneurship and Innovation* (4th ed.). London: Bloomsbury publishing plc.

Cascio, P. R. (2011). Marketing innovation and firm performance research model, research hypothesis and managerial implications. Retrieved from https://stars.library.ucf.edu/etd/1906

Chang, C., Lu, C., & Lai, P. (2021). Examining the drivers of competitive advantage of the international logistics industry. *International Journal of Logistics Research and Application. DOI.10.1080/13675567.2021.1915263*

Chankim, W., & Mauborgne, R. (2015). Blue ocean strategy. How to create uncontested market space and make the competitors irrelevant. Boston: Harvard Business Review Press,

Chijioke, E. O., Chigbu, E. E., & Ajaero, C. K. (2017). Innovation and competitive advantage in the Nigerian downstream petroleum industry. *Journal of Accounting and Financial Management, 3*(1), 55-64.

Christensen, H. (2010). Defining Customer value as the driver of competitive advantage. *Strategy & Leadership, 38*(5), 20-25.

Dajah, S., & Alshora, M. (2022). The impact of innovative marketing on competitive advantage in renewable energy companies in Jordan. *Journal of business and retail management research. 16*(2) Retrieved from https://doi.org/10.24052/JBRMR/V16IS02/ART-07

Damanpour, F. (1991). Organizational innovation: A meta-analysis of effects of determinants and moderators. *Academy of Management Journal, 34*(3), 555-590.

Deimler, M., & Kachaner, N. (2023). Business model innovation. Retrieved from *https://www.bcg.com*

Efrata, T., C., Radianto, W., E., D., Marlina, M., A., E., & Budiono, S. C. (2019). The impact of innovation, competitive advantage, and market orientation on a firm's marketing performance in the garment industry in Indonesia. *Advances in economics, business, and management research.* Retrieved from http://dx.doi.org/10.2991/icoi-19.2019.68

Ehiagbonare, J. E. (2018). Competitive advantage and innovation in the Nigerian downstream oil sector. *International Journal of Social Science and Business, 2*(2), 145-164.

Enyia, D., C. & Nwuche, C. (2020). Innovation: A catalyst for effective engagement and economic growth in challenging times. *DOI:10.46827/ejmms. v5i4.911*

Epetimehin, F. (2011) Achieving competitive advantage in insurance industry: The impact of marketing innovation and creativity. *European Journal of Social Sciences, 19*(1):123-12

Ezie, O., & Baida, O. J. (2014). Nigeria's downstream oil sector deregulation and efficient petroleum pricing. *International Journal of Social and Humanities Reviews. 4*(4), 84-93.

Frederiksen, L., Phelps, S. F., & Kimmons, R. (2018). Introduction to literature reviews. Retrieved from *https://edtechbooks.org*.

Geroni, D. (2021). Business model innovation: Opportunities and barriers. Retrieved from *https://101blockchains.com.*

Grant, R. M. (2022). *Contemporary strategy analysis (*11th ed.). Hoboken, NJ: John Wiley & Sons Inc.

Ifere, S.E. (2011). Privatization of downstream subsector of petroleum industry: An empirical analysis of Nigeria. *Management Science Review, 4*(1&2), 13-33.

Ifere, S.E**.** (2013). Effects of regulatory framework on the performance of Nigeria's petroleum downstream sub-sector. *Tropical Focus: The International Journal Series on Tropical Issues, 14*(2), 14-25.

Ifere, E.S., Nyuur, R. B., Amankwah-Amoah, J., & Ochie, C., (2022) Unconnected to global network: Infrastructural deficit in Africa. *Strategic Change, 31(1). 117-128. https://doi.org/10.1002/jsc.2482*

Izuaka, M. (2023) Subsidy Removal: Nigerian govt approves N5bn palliative to states, FCT. Retrieved from *https://www.premiumtimesng.com/news/headlines/616579-subsidy-removal-nigerian-govt-approves-n5bn-for-each-state-fct.html*.

Kadiri, K. O., & Lawal, S. O. (2016). Deregulating the Nigerians downstream oil sector: Its necessity as way forward to correct the battered aspects of the Nation's economy. *DOI:10.9734/BJEMT/2016/25062*

Kalu, E., O., & Onuoha, B., C. (2023). Business model innovation and competitive advantage of manufacturing firms in Rivers State, Nigeria. *International Journal of Advanced Academic Research, 9*(6), 293-308.

Urabe, K. (1988). *Innovation and management: International comparison.* Berlin, New York: Walter De Gruyter.

Latifi, M., Nikou, S., & Bouwman, H. (2021). Business model innovation and firm performance: Exploring causal mechanisms in SMEs. *Technovation Journal.* Retrieved from *https://doi.org/10.1016/j.technovation.2021.102274*

Lawal, A., Azeez, A. A., & Tella, M. (2019). Innovation and competitive advantage in Nigeria's downstream oil and gas industry: An empirical investigation. *Journal of African Business, 20*(3), 350-372.

Manborge, R. (2015). *Blue ocean strategy*. Boston Massachusetts: Harvard Business Review Press.

Morris, L. (2013). Three dimensions of innovation. *International Management Review, 9*(2), 5-10.

Mugo, P. C. (2020). Process innovation and competitive advantage in telecommunication companies. *International Journal of Business Strategy and Automation, 1*(4), 40-55.

Nardi, P.M. (2003). Doing survey research: A guide to quantitative methods. Boston, MA: Allyn and Bacon.

Nkogbu, O. G., & Okorodudu, O. (2015). Deregulation of the downstream sector of the Nigerian petroleum industry. The role of leader. *European Journal of Business and Management. 7*(8), 33-46.

Nkuda, M. O. (2017). Strategic agility and competitive advantage: Exploration of the ntological, epistemological and theoretical underpinnings. *British Journal of Economics, Management and Trade. 16*(1), 1-13

Nolan, D. (2016). Thirteen dimensions of innovation. Retrieved from *Linkedin.com/pulse/13-dimensions-innovation-daniel-nolan*

Odukoya, J. A., Omonijo, O., Mistra, S., & Ahuja, R. (2019). Information technologu in learning institution. An advantage or a disadvantage? Retrieved from *https://doi.org/10.1007/978-3-030-49339-4-34. Link.springer.com*

Ogunleye, G. A. (2015). Innovation and competitive advantage in the Nigerian Oil and gas sector: A study of selected oil marketing companies. *Journal of Economics and Sustainable Development, 6*(3), 111-121.

Oladele, T. (2019). The impact of technological innovation on competitive advantage in the Nigerian downstream oil and gas sector. *Journal of Economics and Sustainable Development, 10*(17), 71-82.

Olusola, J. O. (2021). Deregulation of the downstream petroleum industry: An overview of the legal quandaries and proposal for improvement in Nigeria. *Heliyon Journal.* Retrieved from *https://doi.org/10.1016/j.heliyon.2021.e06848*

Onakoya, A. B., & Orimogunje, O. E. (2017). Innovation and competitive advantage in Nigeria's petroleum industry: A conceptual review. *International Journal of Applied Business and Economic Research, 15*(3), 1-16.

Owoeye, T., & Adetoye, D. (2016). Political economy of downstream sector deregulation in Nigeria. *International Journal of Economics, Commerce and Management*, 4(5), 674-689.

Oyakhire, V. A., & Akpan, P.L. (2021). Competitive strategy and performance of oil and gas companies in Nigeria. *International Journal of Academic Management Science Research, 5*(9) 130-138.

Peng, J., Qin, Q., & Tang, T. (2021). The influence of marketing innovations on firm performance under different market environments: Evidence from China. Retrieved from 10049. DOI:10. 3390.su131810049

Pisano, G. (1997). The development factory: Unblocking the potential of process innovation. Boston: Harvard Business Press.

Porter, M. E. (1985). The competitive advantage: Creating and sustaining superior performance. New York, NY: Free Press

Purchase, S., & Volery, T. (2020). Marketing innovation: A systematic review. *Journal of marketing management, 36*(9-10), 763-793.

Reichstein, T., & Salter, A. (2006). Investigating the sources of process innovation among UK manufacturing firms. *Industrial and Corporate Change, 15*(4), 653-682.

Roopa, S., & Rani, M. (2012). Questionnaire designing for a survey. *The Journal of Indian Orthodontic Society, 46* (4): 273-277.

Santa, R., Hyland, P. & Ferrer, M. (2014). Technological innovation and operational effectiveness: Their role in achieving performance improvement. *Doi:10.1080/09537287.2013.785613*

Sawhney, M., Wolcott, R.C., & Arroniz, I. (2006). The 12 different ways for companies to innovate. *MIT Sloan Management Review.* Retrieved from *https://sloanreview.mit.edu/article/the-different-ways-for-companies-to-innovate/*

Teece, D. J. (2007). Explicating dynamic capabilities: The nature and micro foundations of (sustainable) enterprise performance. *Strategic Management Journal, 28*(13), 1319-1350.

Teece, D.J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal, 18*(7), 509–533.

Twin, A. (2023) Competitive advantage definition with types and examples. Retrieved from *https://www.investopedia.com*

Wheelwright, S. C. (2010). *Managing new product and process development: Text cases*. New York, N.Y.: Simon and Scuster.

Whittington, E., Regner, P., Angwin, D., Johnson, G., & Scholes, K. (2020). *Exploring strategy* (12th ed.*).* Harlow: Pearson Education limited.

Yusuf, K. (2023). Analysis: As fuel subsidy goes. Nigerian government must cut cost of governance. Retrieved from *https://www.premiumeng.com/news/603753-603753.html*

Zahra, S. A., & George, G. (2002). Absorptive capacity: A review, reconceptualization, and extension. *Academy of Management Review, 27*(2), 185-203.