



AMBIDEXTERITY AND ORGANIZATIONAL SUSTAINABILITY OF MIDSTREAM OIL AND GAS FIRMS IN SOUTH-SOUTH, NIGERIA

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Abstract: Midstream oil and gas firms in South-South Nigeria face a persistent paradox of resource wealth coexisting with weak organizational sustainability. Chronic oil spills, gas flaring, operational inefficiencies, and fractured social contracts with host communities collectively underscore the urgency of identifying strategic antecedents of sustainable performance in this sector. This study investigated the relationship between ambidexterity and organisational sustainability of midstream oil and gas firms in South-South, Nigeria, with information technology infrastructure as a moderating variable. The proxies of ambidexterity were exploitative ambidexterity and explorative ambidexterity, while the proxies of organisational sustainability were environmental sustainability, economic sustainability, and social sustainability. The study was anchored on contingency theory, dynamic capabilities theory, the moral responsibility theory of corporate sustainability, and the technology-organization-environment framework. Underpinned by the positivist philosophical paradigm, a cross-sectional survey design was adopted, with primary data collected from 274 middle-to-top management staff drawn from 56 midstream oil and gas firms registered with the Petroleum Technology Association of Nigeria in South-South, Nigeria. Seven null hypotheses were tested at the 0.05 level of significance using Partial Least Squares-Structural Equation Modelling via SmartPLS 4.1.1.7. The findings revealed that exploitative ambidexterity has a strong, positive, and significant relationship with both environmental sustainability and economic sustainability, but a weak, non-significant relationship with social sustainability. Explorative ambidexterity exerted a strong, positive, and highly significant effect on economic sustainability and social sustainability, but a negligible, non-significant effect on environmental sustainability. Information technology infrastructure exerted no significant moderation effect. The study recommended that management teams, operations directors, and HSE officers should institutionalize exploitative ambidexterity as a core environmental sustainability strategy by conducting regular internal environmental performance audits, and investing in incremental improvements to pipeline integrity monitoring systems, gas flaring reduction technologies, and spill containment infrastructure.

Keywords: Ambidexterity, Exploitative Ambidexterity, Explorative Ambidexterity, Organisational Sustainability, Information Technology Infrastructure.

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1.1 Introduction

The oil and gas sector remains the lifeblood of the Nigerian economy, accounting for approximately 65 per cent of government revenue and over 85 per cent of total export earnings (Sam et al., 2024). Within this sector, midstream firms occupy a structurally pivotal position, serving as the critical bridge between upstream exploration and downstream distribution - activities that are formally regulated by the Nigerian Midstream and Downstream Petroleum Regulatory Authority (NMDPRA) under the Petroleum Industry Act (PIA) 2021. Indeed, Nigeria holds proven natural gas reserves of approximately 209.5 trillion cubic feet (TCF), ranking ninth globally, while simultaneously harbouring the largest crude oil reserves in Africa, estimated at 36.9 billion barrels (Adewuyi et al., 2023). Despite this formidable resource base, the midstream subsector has persistently underperformed, characterised by chronic infrastructure deficits, operational inefficiencies, environmental degradation, and volatile financial returns, all of which directly undermine the organisational sustainability of firms operating in this space.

Organisational sustainability in the context of midstream oil and gas firms refers to the capacity of these firms to endure and generate value across environmental, economic, and social dimensions over extended time horizons, without compromising the ecological integrity, financial stability, or social well-being of the communities and ecosystems in which they operate (Iyoha et al., 2025). This multidimensional conceptualization is anchored in the triple bottom line (TBL) framework, which posits that sustainable organisational performance must be evaluated not merely by conventional financial metrics but also by a firm's environmental stewardship and social responsibility (Elkington, 1997). Within the South-South geopolitical zone of Nigeria the urgency of organisational sustainability for midstream oil and gas firms is especially acute

Environmental sustainability, as a dimension of organisational sustainability, concerns the capacity of midstream oil and gas firms to minimise their ecological footprint, comply with environmental regulations, prevent pollution, and restore ecosystems damaged by their operational activities. Empirical evidence from the South-South region reveals the extraordinary gravity of environmental unsustainability in this sector. In the Niger Delta, cumulative oil pollution equivalent to more than 13 million barrels of crude has devastated mangrove ecosystems, destroyed farmlands and aquatic livelihoods, and generated greenhouse gas (GHG) emissions estimated at 714.62 million tonnes of CO₂e between 2002 and 2024, alongside direct revenue losses of US\$56.75 billion arising from gas flaring (Iyoha et al., 2025).

The potential moderating role of information technology (IT) infrastructure in the relationship between ambidexterity and organisational sustainability is a further dimension of theoretical and practical importance. IT infrastructure which encompasses the shared portfolio of hardware, software, network systems, data management platforms, and IT personnel competencies, provides the foundational digital capability that enables firms to simultaneously coordinate their exploitative activities with precision and efficiency while empowering the exploratory scanning, sensing, and innovation processes that drive long-term adaptation (Byrd & Turner, 2000; Duncan, 1995).

Against this backdrop, the present study sought to empirically investigate the relationship between ambidexterity, operationalized through exploitative ambidexterity and explorative ambidexterity, and organisational sustainability, measured across environmental, economic, and social dimensions of midstream oil and gas firms operating in South-South, Nigeria

1.2 Statement of the Problem

Midstream oil and gas firms operating in South-South, Nigeria are confronted with a deeply entrenched and multifaceted problem of weak organisational sustainability. Despite the region's extraordinary endowment with hydrocarbon resources the midstream subsector continues to record persistently deficient performance across environmental, economic, and social sustainability dimensions. This paradox of resource wealth and operational unsustainability constitutes the central problem motivating the present investigation.

The manifestations of weak organisational sustainability are numerous, observable, and empirically documented. From an environmental standpoint, midstream oil and gas firms in South-South Nigeria have been implicated in systematic ecological destruction arising from chronic oil spills, gas flaring, pipeline leaks, and inadequate environmental remediation (Iyoha et al., 2025). From an economic sustainability perspective, these firms have demonstrated persistent operational inefficiencies, underutilisation of existing gas infrastructure, chronic underfunding of pipeline maintenance, and vulnerability to oil theft (Sam et al., 2024). As such, oil production, which feeds the midstream transportation and processing pipeline, has persistently fallen short of OPEC quotas, with daily production averaging 1.43 million bpd in 2024 against an allocated quota of 1.5 million bpd. The social sustainability dimension is equally distressing. The South-South region, despite generating the bulk of Nigeria's hydrocarbon wealth, remains characterised by poverty, environmental-induced health crises, social unrest, and a persistent breakdown in

the social contract between midstream oil and gas firms and their host communities (Bello & Nwaeke, 2023).

The present study departs from existing scholarship by specifically situating the empirical investigation within the midstream oil and gas subsector of South-South Nigeria. By simultaneously examining exploitative and explorative ambidexterity as predictors of environmental, economic, and social sustainability, and by modelling the moderating role of IT infrastructure within an integrated theoretical framework, this study provides a comprehensive, contextually grounded, and methodologically sophisticated contribution to the growing body of knowledge on organisational ambidexterity and sustainability of midstream oil and gas firms in South-South, Nigeria.

1.3 Research Hypotheses

The following null hypotheses were formulated to provide tentative answers to the research questions:

- H₀₁: There is no significant relationship between exploitative ambidexterity and environmental sustainability of midstream oil and gas firms in South-South, Nigeria.
- H₀₂: There is no significant relationship between exploitative ambidexterity and economic sustainability of midstream oil and gas firms in South-South, Nigeria.
- H₀₃: There is no significant relationship between exploitative ambidexterity and social sustainability of midstream oil and gas firms in South-South, Nigeria.
- H₀₄: There is no significant relationship between explorative ambidexterity and environmental sustainability of midstream oil and gas firms in South-South, Nigeria.

H₀₅: There is no significant relationship between explorative ambidexterity and economic sustainability of midstream oil and gas firms in South-South, Nigeria.

H₀₆: There is no significant relationship between explorative ambidexterity and social sustainability of midstream oil and gas firms in South-South, Nigeria.

H₀₇: Information technology infrastructure does not significantly moderate the relationship between ambidexterity and organizational sustainability of midstream oil and gas firms in South-South, Nigeria.

2.0 Theoretical Standpoints

Contingency Theory (Burns & Stalker, 1961).

Contingency Theory was initially proposed by Fred Edward Fiedler in 1964, with its foundational articulation appearing in his seminal work: *A Theory of Leadership Effectiveness* (Fiedler, 1967). The arguments underpinning Contingency Theory emphasize the complexity and dynamism of organisational environments. Unlike universalist theories, it recognizes that organizations operate in conditions that are varied, uncertain, and subject to change (Lartey, 2020). Consequently, the strategies organizations adopt must be responsive to the specific situational forces they face. This perspective resonates strongly with contemporary organisational realities characterized by volatility, globalization, regulatory pressure, and technological disruption. Critics of earlier models frequently noted their failure to explain why strategies succeeded in one context but failed in another; Contingency Theory addresses this by demonstrating that effectiveness is a function of contextual fit rather than intrinsic strategy quality (Vrontis et al., 2025).

2.1 Conceptual Framework

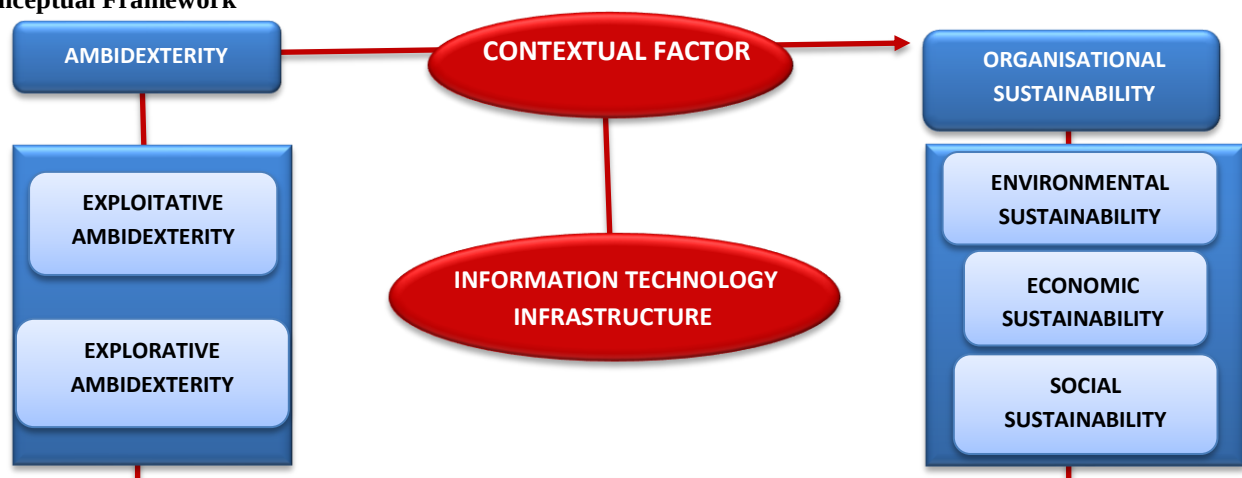


Figure 1: Conceptual Framework of the Study. Dimensions of Ambidexterity were adopted from Oduro, Alharthi and Alsharif (2022). Measures of Organizational Sustainability were adopted from (Nicolaesal, Alpopi & Zacharia, 2015). Information Technology Infrastructure was adopted from (Verma & Juyasimta, 2014).

Organizational Sustainability

Sustainability has become one of the most critical concepts in contemporary management and organisational studies, reflecting the growing demand for firms to balance economic performance with environmental stewardship and social responsibility. It succinctly captures the idea that businesses must not only survive in competitive markets but also adapt to shifting societal expectations and ecological constraints. The word "sustainability" dates back to the late seventeenth century, where it finds its etymological roots in the Latin *sustinere*, meaning to hold up, support, or maintain over time (Caradonna, 2022).

Environmental Sustainability

Environmental sustainability has become a cornerstone concept in contemporary debates on organisational responsibility and global development. It reflects the imperative for human activity and industrial operations to coexist with, rather than degrade, the natural systems that support life. At its core, environmental sustainability is about ensuring that economic growth and technological progress do not compromise ecological integrity, biodiversity, or the capacity of future generations to meet their needs (Ziaul, I. M., & Shuwei, 2023). It integrates principles of conservation, resource efficiency, and ecological balance, positioning organizations as stewards of the environment rather than mere exploiters of natural resources. The term "environmental sustainability" draws its etymological roots from two distinct linguistic traditions. "Environment" derives from the Old French *environner*, meaning to surround or encircle, which itself traces back to the Latin *viron*, referring to a circle or surrounding area (Chang, 2019). When merged with sustainability, environmental sustainability carries the foundational meaning of maintaining, supporting, and preserving the natural systems that surround human and organisational activity across time (Uralovich et al., 2023).

Economic Sustainability

Economic sustainability has emerged as a central pillar of the broader sustainability discourse, reflecting the need for organizations and societies to balance immediate financial performance with long-term viability. Rooted in the global development agenda that gained prominence in the late twentieth century, the concept was crystallized by the Brundtland Commission's 1987 report, which defined sustainable development as meeting present needs without compromising the ability of future generations to meet theirs. Within this framework, economic sustainability emphasizes the capacity of organizations to generate consistent value, maintain competitiveness, and adapt to shifting market conditions while safeguarding resources for the future (Rodriguez et al., 2002).

Social Sustainability

Social sustainability as a concept has its etymological roots in the broader sustainability discourse that emerged in the late twentieth century, particularly following the Brundtland Commission's report of 1987. While sustainability was initially framed in ecological and economic terms, scholars soon recognized that the social dimension was equally critical. Social sustainability thus came to mean the capacity of organisations and societies to foster equity, justice, inclusion, and well-being over the long term (Germain, 2022). It emphasizes the human and community aspects of sustainability, focusing on how organisations contribute to social cohesion, fair treatment, and the improvement of quality of life (Ntinda & Reed, 2024).

Different scholars have attributed varied meanings to social sustainability, reflecting disciplinary perspectives and contextual realities. Vallance et al. (2011) distinguished between "developmental" social sustainability, which focuses on meeting basic needs, "bridging" social sustainability, which emphasizes equity and inclusion, and "maintenance" social sustainability, which seeks to preserve cultural values and social capital.

2.2.5 Ambidexterity

Ambidexterity has become paramount to organisational theory discourse, capturing the ability of firms to balance competing demands for efficiency and innovation. In management research, it refers to the simultaneous pursuit of exploitative activities, focused on refining existing capabilities and explorative activities aimed at discovering new opportunities (Tallot, 2018). This dual orientation is seen as essential for organisations operating in dynamic and uncertain environments, where resilience depends on both short-term performance and long-term adaptability. The term itself originates from the Latin *ambidexter*, literally meaning "right-handed on both sides," and was initially used in biological and medical contexts to describe individuals capable of using both hands with equal skill (Von Staden, 2002). Over time, scholars adopted the metaphor to describe organisational competence in managing contradictory strategic imperatives, positioning ambidexterity as a defining capability for sustainable success. However, it was March's (1991) landmark paper on exploration and exploitation in organisational learning that gave the concept its enduring theoretical architecture, establishing the fundamental tension that ambidextrous organisations must navigate balancing the search for new knowledge and capabilities against the efficient deployment of existing ones. Since then, organisational ambidexterity has grown into one of the most extensively studied and debated constructs in strategic management and organisational theory.

2.3 Empirical Review

Jacobs & Maritz (2020) conducted a study to understand dynamic strategy: investigating the ambidexterity–performance relationship. The study aimed to determine whether organisations in emerging economic contexts demonstrate ambidexterity for sustainable performance in the long term and what the effects of environmental turbulence are on the ambidexterity and sustainable performance relationship. A non-probability sampling method, more specifically, convenience sampling, was used to obtain a sample for the study. The sample consisted of profit-seeking organisations from many different industries within South Africa, including, but not limited to, manufacturing, business services, finance, hospitality and tourism, and retail and wholesale. The research was conducted during the 2017 financial year. The study used self-administered questionnaires and telephonic surveys. A total of 157 completed surveys were successfully collected, with a minimum of 150 usable answers for each question. Pearson product-moment correlation test was used to evaluate the correlations between the variables. A multiple regression model was used to examine what the moderating effect of environmental turbulence will be on the ambidexterity and sustainable performance relationship. The study revealed that moderate to strong relationships exist between the two sub-dimensions of ambidexterity and sustainable performance. The findings depict a strong relationship between exploration and exploitation as the sub-dimensional constructs of ambidexterity, reinforcing existing literature on simultaneous exploration and exploitation. There was no statistically significant information, indicating that environmental turbulence moderates the ambidexterity and sustainable performance relationship. Considering the strong positive relationship between the two sub-dimensions of ambidexterity and sustainable organisational performance, it is advisable for management of South African organisations to focus on ambidextrous strategies for sustaining performance in turbulent environments. The study contributes to the limited body of knowledge investigating ambidexterity as a dynamic capability in an emerging economic context. The

study also contributes to clarify the ambidexterity and sustainable performance relationship in terms of whether organisations can simultaneously explore and exploit and what type of relationship exists between ambidexterity and sustainable performance as previous studies delivered mixed results.

Methodology

3.1 Research Design

This study adopted a cross-sectional survey research design, on an explanatory basis, while the research approach is deductive. A cross-sectional survey research design is considered most suitable for this study because data was collected at a single point in time, as the researcher was interested in observing the study variables, without any attempt to manipulate or control them

3.2 Population of the Study

Population is a set of homogeneous items, elements, observations or participants that meet the criteria for inclusion in a study. The target population comprised all the midstream oil and gas firms in South-South, Nigeria. However, the elements of the accessible population were restricted to 950 middle-top management staff drawn from the 56 midstream oil and gas firms in South-South, Nigeria who are registered with the Petroleum Technology Association of Nigerian (PETAN). The selection criteria is based registration with PETAN and having a physical office presence in South-South, Nigeria. Specifically, the identified middle-top management staff with designations such as: Logistic Managers, HSE Managers, Operations Managers, Admin Managers, and Human Resource Managers, were more suited to respond to the survey.

4.1 Results and Analysis

The results and analysis of data for the study provide results based on the distribution and the association between the variables of the study, comprising the demographic, univariate, bivariate, and multivariate levels of analyses. The details of the field activities of the study are presented in Table 4.1.

Table 4.1: Distributions and Retrieved Copies of Questionnaire

Detailed Rate	Response	Distributed	Retrieved	Not Retrieved	Discarded	Used Copies
Total		274 (100%)	234 (85.40%)	40 (14.60%)	12 (4.40%)	222 (81.02%)

Source: Research Survey, 2026

Table 4.1 presents the distribution and retrieval profile of the questionnaire administered for the study. A total of 274 copies of the structured questionnaire were distributed to respondents drawn from midstream oil and gas firms in South-South, Nigeria, representing 100% of the instruments administered. Out of this number, 234 copies were successfully retrieved from the field, yielding a retrieval rate of 85.40%, while 40 copies, representing 14.60% of the distributed instruments, were not returned by respondents despite repeated follow-up efforts. A further screening of the retrieved copies revealed that 12 copies, constituting 4.40% of the distributed instruments, were either improperly completed, contained substantial missing responses, or exhibited patterned answering that rendered them unsuitable for analysis; these copies were accordingly discarded to

preserve the integrity of the dataset. Consequently, 222 copies, representing 81.02% of the total distributed copies of the questionnaire, were found valid and usable, and these constituted the effective sample size for the analyses reported in this chapter

Assessment of Discriminant Validity (HTMT Criterion)

Discriminant validity was assessed using the Heterotrait-Monotrait (HTMT) ratio of correlations, following the recommendation of Henseler, Ringle, and Sarstedt (2015). The HTMT criterion requires all inter-construct HTMT values to be below the threshold of 0.85 to confirm discriminant validity. Table 4.22 presents the HTMT matrix for all constructs.

Table 4.22: Discriminant Validity Assessment – HTMT Matrix

Construct	EXPLOIT	EXPLORE	ENVSUS	ECOSUS	SOCUS	ITI
EXPLOIT						
EXPLORE	0.614					
ENVSUS	0.589	0.575				
ECOSUS	0.573	0.560	0.633			
SOCUS	0.596	0.583	0.644	0.620		
ITI	0.545	0.533	0.576	0.558	0.571	

Source: SmartPLS Data Output (2026)

Where: Ambi = Ambidexterity; Exploit = Exploitative Ambidexterity; Explor = Explorative Ambidexterity; Ecosus = Economic Sustainability; ENSUS = Environmental Sustainability; Sosus = Social Sustainability; OS = Organisational Sustainability; ITI = Information Technology Infrastructure

Table 4.22 presents the HTMT ratios for all construct pairs. All HTMT values are below the conservative threshold of 0.85 (Henseler et al., 2015), ranging from 0.533 (ITI–EXPLORE) to 0.644 (SOCUS–ENVSUS). These results confirm that all constructs are empirically distinct and that discriminant validity is established for the measurement model. The highest HTMT value of 0.644 between Social

Sustainability and Environmental Sustainability is theoretically plausible given the overlapping elements of the triple bottom line (Elkington, 1997), but remains well within the acceptable threshold. The measurement model assessment thus provides a solid foundation for structural model evaluation.

4.3. Assessment of Structural Model (Inner Model) and Hypotheses Testing

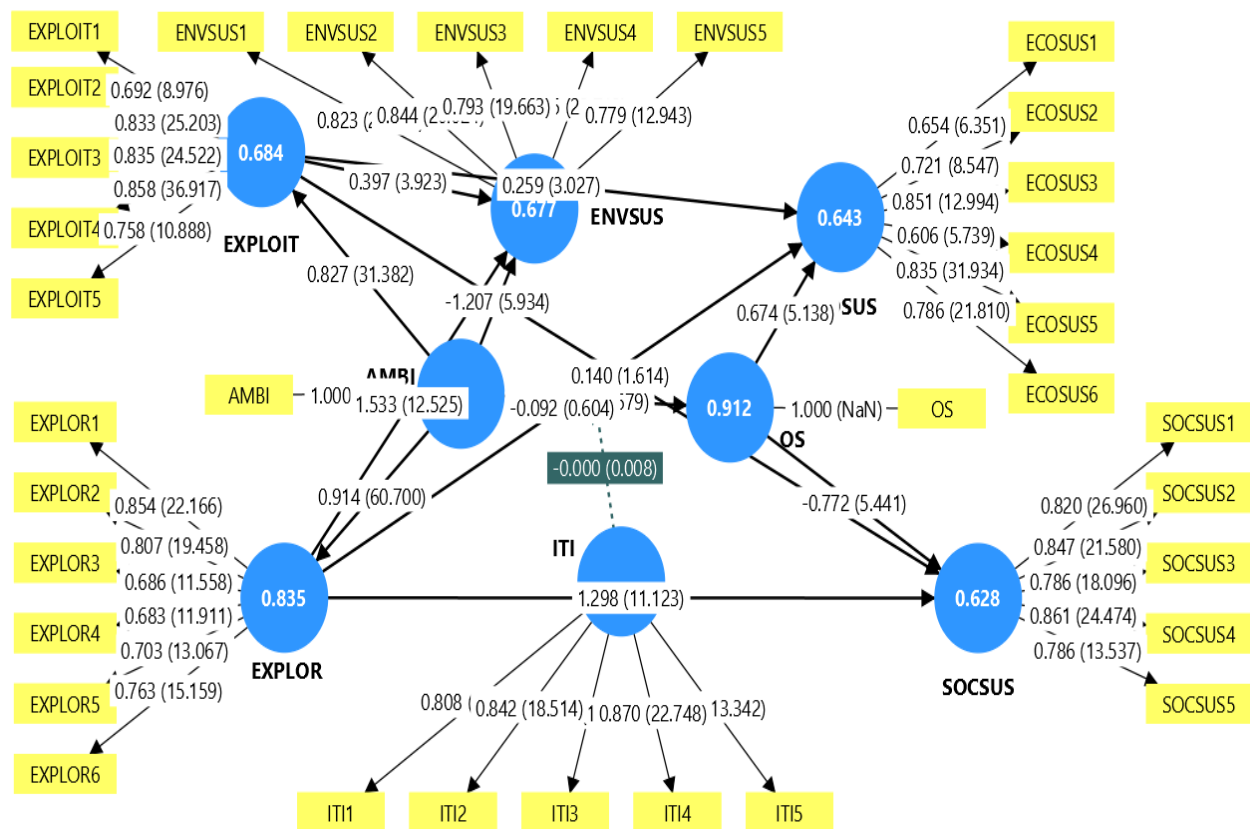


Table 4.23: Total Effects – Structural Model Results and Hypotheses Testing

Relationship	Original sample (O)	R ²	Standard deviation (STDEV)	T statistics (O/STDEV)	P values	Decision on Null Hypothesis
EXPLOIT -> ECOSUS	0.659	0.569	0.086	3.027	0.002	Not Supported
EXPLOIT -> ENVISUS	0.597	0.695	0.101	3.923	0.000	Not Supported
EXPLOIT -> SOCSUS	0.140	0.140	0.087	1.614	0.107	Supported
EXPLOR -> ECOSUS	-0.092	0.089	0.152	0.604	0.546	Supported
EXPLOR -> ENVISUS	0.533	0.654	0.122	12.525	0.000	Not Supported
EXPLOR -> SOCSUS	0.698	0.731	0.117	11.123	0.000	Not Supported
ITI x AMBI -> OS	0.000	0.122	0.041	0.008	0.994	Supported

Where: Ambi = Ambidexterity; Exploit = Exploitative Ambidexterity; Explor = Explorative Ambidexterity; Ecosus = Economic Sustainability; ENSUS = Environmental Sustainability; Sosus = Social Sustainability; OS = Organisational Sustainability; ITI = Information Technology Infrastructure

4.1.9 Interpretation of Results

As revealed from figures 4.8; 4.9 and Tables 4.20, six null hypotheses were supported while four null hypotheses were not supported. Moreso, Cohen (1988) recommended that path coefficients (β values) of 0.10 to 0.29, 0.30 to 0.49 and

0.50 to 1.0 are weak, moderate and strong correlations, respectively. Also, for a two tailed test, t -values >1.96 and p -values <0.05 are significant, while t -values <1.96 and p -values >0.05 are non-significant (Hair et al., 2014). The data analysis reveals the following outcomes from the test of the formulated hypotheses at 0.05 significance level.

4.1.9.1 Relationship between Exploitative Ambidexterity and Environmental Sustainability

As shown in figures 4.16 and 4.17; and Table 4.23, The PLS-SEM analysis for H_{01} , which states that there is no significant relationship between exploitative ambidexterity and environmental sustainability of midstream oil and gas firms in South-South, Nigeria, produced a path coefficient (β) of 0.659, a t-value of 3.027, a p-value of 0.002, and a coefficient of determination (R^2) of 0.569. Based on the benchmark provided by Cohen (1988), a β value of 0.659 falls within the range of 0.50 to 1.0, which indicates a strong positive relationship between exploitative ambidexterity and environmental sustainability. Since the t-value of 3.027 exceeds the threshold of 1.96 and the p-value of 0.002 is less than the 0.05 significance level for a two-tailed test (Hair et al., 2014), the relationship is statistically significant. Furthermore, the R^2 value of 0.569, when evaluated against the cut-off points recommended by Hair et al. (2014), indicates a moderate level of predictive accuracy, meaning that exploitative ambidexterity explains approximately 56.9% of the variance in environmental sustainability of the sampled midstream oil and gas firms. On the basis of these results, the null hypothesis (H_{01}) is rejected, and the alternative hypothesis is accepted, confirming that exploitative ambidexterity has a strong, positive, and significant relationship with environmental sustainability of midstream oil and gas firms in South-South, Nigeria.

4.1.9.2 Relationship between Exploitative Ambidexterity and Economic Sustainability

As established in figures 4.16 and 4.17; and Table 4.23, the test of H_{02} , which states that there is no significant relationship between exploitative ambidexterity and economic sustainability of midstream oil and gas firms in South-South, Nigeria, yielded a path coefficient (β) of 0.597, a t-value of 3.923, a p-value of 0.000, and a coefficient of determination (R^2) of 0.695. Based on Cohen's (1988) classification, the β value of 0.597 falls within the range of 0.50 to 1.0, indicating a strong positive relationship between exploitative ambidexterity and economic sustainability. The t-value of 3.923, which far exceeds the 1.96 threshold for a two-tailed test, and the p-value of 0.000, which is well below the 0.05 significance level (Hair et al., 2014), collectively confirm that this relationship is statistically significant. The R^2 value of 0.695 exceeds the 0.50 threshold for a moderate level of predictive accuracy and approaches the 0.75 benchmark for substantial predictive accuracy as suggested by Hair et al. (2014), indicating that exploitative ambidexterity explains approximately 69.5% of the variance in economic sustainability of the sampled midstream oil and gas firms. On the basis of these results, the null hypothesis (H_{02}) is rejected, and the alternative hypothesis is accepted, confirming that exploitative ambidexterity has a strong,

positive, and significant relationship with economic sustainability of midstream oil and gas firms in South-South, Nigeria.

4.1.9.3 Relationship between Exploitative Ambidexterity and Social Sustainability

As indicated in Figures 4.16 and 4.17; and Table 4.23 the test of H_{03} , which states that there is no significant relationship between exploitative ambidexterity and social sustainability of midstream oil and gas firms in South-South, Nigeria, produced a path coefficient (β) of 0.140, a t-value of 1.614, a p-value of 0.107, and a coefficient of determination (R^2) of 0.140. Based on Cohen's (1988) classification, a β value of 0.140 falls within the range of 0.10 to 0.29, indicating a weak positive relationship between exploitative ambidexterity and social sustainability. The t-value of 1.614 is below the 1.96 threshold for a two-tailed test and the p-value of 0.107 exceeds the 0.05 significance level (Hair et al., 2014), confirming that this relationship is statistically non-significant. The R^2 value of 0.140 also falls below the 0.25 threshold for even a weak level of predictive accuracy as recommended by Hair et al. (2014), indicating that exploitative ambidexterity explains only 14.0% of the variance in social sustainability, a weak explanatory contribution. On the basis of these results, the null hypothesis (H_{03}) is retained, as the data do not provide sufficient evidence to conclude that exploitative ambidexterity has a significant relationship with social sustainability of midstream oil and gas firms in South-South, Nigeria.

4.1.9.4 Relationship between Explorative Ambidexterity and Environmental Sustainability

As shown in figures 4.16 and 4.17; and Table 4.23, the test of H_{04} , which states that there is no significant relationship between explorative ambidexterity and environmental sustainability of midstream oil and gas firms in South-South, Nigeria, yielded a path coefficient (β) of -0.092, a t-value of 0.604, a p-value of 0.546, and a coefficient of determination (R^2) of 0.089. The β value of -0.092, while technically falling within the 0.10 to 0.29 weak range in absolute terms, is negative and its absolute value falls below the lower boundary recommended by Cohen (1988), indicating a negligible and inverse relationship between explorative ambidexterity and environmental sustainability. The t-value of 0.604 is substantially below the 1.96 threshold for a two-tailed test, and the p-value of 0.546 is considerably higher than the 0.05 significance level (Hair et al., 2014), jointly confirming that this relationship is statistically non-significant. The R^2 value of 0.089 is also below the 0.25 threshold for even a weak level of predictive accuracy as defined by Hair et al. (2014), indicating that explorative ambidexterity explains only 8.9% of the variance in environmental sustainability, representing negligible

predictive power. On the basis of these results, the null hypothesis (Ho4) is retained, as the data do not provide sufficient evidence to conclude that explorative ambidexterity has a significant relationship with environmental sustainability of midstream oil and gas firms in South-South, Nigeria.

4.1.9.5 Relationship between Explorative Ambidexterity and Economic Sustainability

As revealed in figures 4.16 and 4.17; and Table 4.23, the test of H_{05} , which states that there is no significant relationship between explorative ambidexterity and economic sustainability of midstream oil and gas firms in South-South, Nigeria, produced a path coefficient (β) of 0.533, a t-value of 12.525, a p-value of 0.000, and a coefficient of determination (R^2) of 0.654. Based on Cohen's (1988) classification, a β value of 0.533 falls within the range of 0.50 to 1.0, indicating a strong positive relationship between explorative ambidexterity and economic sustainability. The t-value of 12.525, which far surpasses the 1.96 threshold for a two-tailed test, and the p-value of 0.000, which is substantially below the 0.05 significance level (Hair et al., 2014), jointly confirm an exceptionally statistically significant relationship. The R^2 value of 0.654, which exceeds the 0.50 threshold for a moderate level of predictive accuracy and approaches the 0.75 substantial benchmark as suggested by Hair et al. (2014), indicates that explorative ambidexterity explains approximately 65.4% of the variance in economic sustainability of the sampled midstream oil and gas firms. On the basis of these results, the null hypothesis (Ho5) is rejected, and the alternative hypothesis is accepted, confirming that explorative ambidexterity has a strong, positive, and highly significant relationship with economic sustainability of midstream oil and gas firms in South-South, Nigeria.

4.1.9.6 Relationship between Explorative Ambidexterity and Social Sustainability

As shown in figures 4.16 and 4.17; and Tables 4.23, the test of H_{06} , which states that there is no significant relationship between explorative ambidexterity and social sustainability of midstream oil and gas firms in South-South, Nigeria, produced a path coefficient (β) of 0.698, a t-value of 11.123, a p-value of 0.000, and a coefficient of determination (R^2) of 0.731. Based on Cohen's (1988) classification, a β value of 0.698 falls within the range of 0.50 to 1.0, indicating a strong positive relationship between explorative ambidexterity and social sustainability. The t-value of 11.123, which far exceeds the 1.96 threshold for a two-tailed test, and the p-value of 0.000, which is far below the 0.05 significance level (Hair et al., 2014), jointly confirm an exceptionally statistically significant relationship. Furthermore, the R^2 value of 0.731 approaches the 0.75 threshold for substantial predictive accuracy as

recommended by Hair et al. (2014), indicating that explorative ambidexterity explains approximately 73.1% of the variance in social sustainability of the sampled midstream oil and gas firms, representing the highest explanatory power observed among all six direct hypotheses tested in the study. On the basis of these results, the null hypothesis (Ho6) is rejected, and the alternative hypothesis is accepted, confirming that explorative ambidexterity has a strong, positive, and highly significant relationship with social sustainability of midstream oil and gas firms in South-South, Nigeria.

4.3.1 The Moderating Role of Information technology infrastructure on the relationship between ambidexterity and organizational sustainability.

As revealed in figures 4.16 and 4.17; and Tables 4.23, the test of H_{07} , which states that information technology infrastructure does not significantly moderate the relationship between ambidexterity and organisational sustainability of midstream oil and gas firms in South-South, Nigeria, produced a path coefficient (β) of 0.000, a t-value of 0.008, a p-value of 0.994, and a coefficient of determination (R^2) of 0.122. Based on Cohen's (1988) classification, a β value of 0.000 indicates the complete absence of any directional relationship between the interaction term (information technology infrastructure as a moderator) and organisational sustainability. The t-value of 0.008 is substantially below the 1.96 threshold for a two-tailed test, and the p-value of 0.994 is vastly above the 0.05 significance level (Hair et al., 2014), confirming that the moderation effect of information technology infrastructure on the ambidexterity–organisational sustainability relationship is entirely non-significant. The R^2 value of 0.122 falls below the 0.25 threshold for even a weak level of predictive accuracy as defined by Hair et al. (2014), indicating that the moderated model explains only 12.2% of the variance in organisational sustainability when information technology infrastructure is introduced as a moderating variable. On the basis of these results, the null hypothesis (Ho7) is retained, as the data do not provide any evidence that information technology infrastructure significantly moderates the relationship between ambidexterity and organisational sustainability of midstream oil and gas firms in South-South, Nigeria.

5.1 Summary of Findings

The overall objective of the study was to examine the relationship between ambidexterity and organisational sustainability of midstream oil and gas firms in South-South, Nigeria, with information technology infrastructure as the moderating variable. The dimensions of ambidexterity were exploitative ambidexterity and explorative ambidexterity, while the proxies of organisational sustainability were environmental sustainability, economic sustainability, and

social sustainability. Seven hypotheses were tested at the 0.05 level of significance using Partial Least Squares-Structural Equation Modelling (PLS-SEM). The study was anchored on contingency theory (Burns & Stalker, 1961), dynamic capabilities theory (Teece, Pisano & Shuen, 1997), moral responsibility theory of corporate sustainability (Brookshire, 2017), and the technology-organisation-environment (TOE) framework (Tornatzky & Fleischer, 1990).

5.2 Conclusions

This study examined the relationship between ambidexterity and organisational sustainability of midstream oil and gas firms in South-South, Nigeria, with information technology infrastructure as a moderating variable. The findings of the study present a nuanced and contextually rich picture of how the dual strategic orientations of exploitation and exploration differentially shape the three dimensions of organisational sustainability in one of Africa's most strategically significant and environmentally complex industrial regions. The study concludes that exploitative ambidexterity is a powerful and reliable driver of both environmental and economic sustainability in the midstream oil and gas sector of South-South Nigeria, confirming that the systematic refinement and deepening of existing operational competencies, environmental management routines, and throughput efficiency frameworks constitutes a foundational sustainability strategy for firms in this capital-intensive and compliance-intensive industrial context. The study further concludes that explorative ambidexterity is an exceptionally potent driver of both economic and social sustainability, with the latter relationship producing the strongest predictive power observed across all hypotheses tested in the study, confirming that the capacity to discover novel business pathways and develop innovative community engagement strategies is critically important for achieving long-run viability in the volatile and socially complex operating environment of South-South Nigeria

5.3 Recommendations

Based on the findings of the study, the following recommendations are made:

- I. Management teams, operations directors, and health, safety and environment (HSE) officers of midstream oil and gas firms in South-South Nigeria should institutionalise exploitative ambidexterity as a core environmental sustainability strategy by systematically deepening and formalising existing environmental management routines across all operational levels of their organisations. This should be achieved by conducting regular internal environmental performance audits to identify existing environmental protocols that have demonstrated effectiveness and that can be further refined and scaled; establishing environmental standard operating procedure (SOP) repositories that

document best-practice environmental protocols and make them accessible to all operational staff; investing in incremental improvements to pipeline integrity monitoring systems, gas flaring reduction technologies, and spill containment infrastructure; and building a continuous improvement culture within HSE departments that treats the systematic deepening of existing environmental competencies as an ongoing organisational priority rather than a one-time compliance exercise.

- II. Chief financial officers, strategic planning executives, and operations managers of midstream oil and gas firms in South-South Nigeria should systematically leverage exploitative ambidexterity as the primary mechanism for strengthening economic sustainability by prioritising the continuous optimisation of existing infrastructure, deepening operational efficiency frameworks, and institutionalising cost management disciplines across all throughput and logistics functions. This should be accomplished by conducting regular infrastructure utilisation reviews to identify underperforming assets and operational bottlenecks that can be addressed through incremental process improvements; deploying lean operations principles to refine throughput management, pipeline scheduling, and storage facility utilisation; establishing cost efficiency benchmarking programmes that compare the firm's operational performance against industry best practice and drive continuous improvement; and building incentive structures that reward operational teams for measurable improvements in throughput efficiency, cost reduction, and asset utilisation.
- III. Corporate social responsibility managers, community relations officers, and senior management teams of midstream oil and gas firms in South-South Nigeria should go beyond exploitative ambidexterity and seek other alternatives for achieving social sustainability. These could be achieved by engaging in participatory needs assessment exercises with host community stakeholders to identify unmet social needs that existing social sustainability frameworks do not adequately address; partnering with academic institutions, civil society organisations, and development agencies to co-develop innovative social sustainability models adapted to the specific socio-cultural dynamics of South-South Nigerian communities.

5.4 Contributions to Knowledge

This study makes the following contributions to knowledge:

- i. Furthermore, the study contributes to knowledge by producing context-specific empirical evidence on the role of ambidexterity in driving organisational sustainability within the Nigerian midstream oil and gas sector. The unique combination of institutional complexity, community sensitivity, regulatory demands, and environmental challenges that characterise the South-South Nigerian oil and gas operating environment makes the findings of this study

a distinctive and original contribution to the growing body of scholarship on ambidexterity and sustainability in developing-economy extractive industry contexts.

- ii. The study also makes a methodological contribution by applying Partial Least Squares-Structural Equation Modelling (PLS-SEM) via SmartPLS to the examination of the ambidexterity–sustainability relationship in the Nigerian midstream oil and gas sector, a methodological choice that is particularly appropriate for the complex multi-construct, multi-relationship model tested in the study.

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