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Diversification and Performance of Nigerian Manufacturing Firms

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Abstract
Nigeria's manufacturing sector contributes just 8–9% of GDP below the lower-middle-income country benchmark of 10–16%. Against this backdrop, this study examines how corporate diversification strategy shapes the market-based performance of listed Nigerian manufacturing firms over the period 2013–2023. This study focuses on three things the existing literature has not yet carefully examined: whether performance effect differs by diversification type, whether the relationship follows a non-linear path, and whether there is an optimal diversification threshold beyond which further expansion begins to destroy rather than create value. Using an unbalanced panel of approximately 3,850 firm-year observations drawn from NGX-listed manufacturers, four regression models are estimated with Tobin's q as the dependent variable. Diversification is measured using three complementary instruments: segment count, the Herfindahl-Hirschman Index, and the Entropy Measure decomposed into related and unrelated components following Jacquemin and Berry (1979). Four findings emerge. Aggregate diversification is negatively associated with market-based performance, confirming a diversification discount. Related within-industry diversification, however, earns a performance premium, while unrelated conglomerate diversification carries a penalty. The relationship is non-linear, with an estimated performance-maximising threshold of approximately five to six business segments. Firms operating at this level generate significantly stronger accounting returns, even as equity markets apply a governance discount. It concludes that diversification type and intensity matter more than diversification in aggregate. Managers are advised to expand within their area of genuine competence rather than pursue conglomerate breadth. Policymakers should address the institutional voids that currently incentivise value-destroying unrelated diversification among Nigerian manufacturers.

Keywords: Corporate Diversification, Entropy Measure, Nigerian Manufacturing, Tobin's q
JEL Classification Codes: L25, C58, L60, G34

1. Introduction

The question of whether a firm is better served by doing one thing exceptionally well or spreading its activities across many fronts is a question that has occupied scholars of finance, corporate strategy, and development economics for the better part of a century and one that remains genuinely unresolved. The argument in support of doing one thing very well is simple and is supported by scholars like Porter (1980, 1985), Berger and Ofek (1995); Servaes (1996) with the logic being that you master your craft by going deep and not wide essentially focusing your attention and resources in a small clearly defined area resisting temptation to spread resources wide over a broad area. The belief is that focus and value is lost by spreading and there have been empirical studies which support this view particularly from developed countries.

However, this view goes against conventional wisdom of not putting all your eggs in one basket. Scholars like Penrose (1959); Khanna and Palepu (1997, 2000a, 2000b) and Villalonga (2004) are some of the proponents that support this view. The logic behind this view is that by diversifying the firm has a better hedge against the unexpected and protects the firm from fluctuations in particular sectors of the economy. Both strands of the debate have over the years provided persuasive arguments about their views however there is no consensus is to which strategy is superior. In the 1960s and 1970s the convention wisdom was that diversification was the optimal policy and most companies moved toward the conglomerate model diversifying their interest across various industries and sectors. However, in the 1990s empirical studies showed that broadly diversified firms trade at lower valuations than their more focused peers on stock exchanges coining the phrases diversification discount questioning the need for diversification.

On the contrary Khanna and Palepu (1997, 2000a, 2000b) show that in weak markets where credit is rationed and information asymmetry exist diversified firms can create genuine value by substituting for the coordinating functions that well-developed markets perform cheaply in richer countries. This process allows for a rational adaptation for firms in developing countries both positions have their merits and the interplay between the positions is what the debate is about. Nigeria presents a particularly instructive case study in which to examine these dynamics. Nigeria Africa's most populous country and largest economy by nominal GDP with a manufacturing sector that has underperformed expectation. The National Bureau of Statistics [NBS] (2023) announced that between 2018 and 2022 the sector contributed between 8–9% of GDP which is less than the 10–16% band for lower middle-income country and well below the 25–30% targets set in successive national development plans (World Bank, 2023).

This trend of underperforming manufacturing sector goes back to the oil boom of the 1970s where the massive influx of petrodollars strengthened the naira, made imports cheaper, and weakened domestic

production, creating a dependence on foreign goods while discouraging local manufacturing enterprise (Hirschman, 1958; Khanna & Palepu, 2000a, 2000b). The situation was further worsened by the Structural Adjustment Programme of 1986 which inflicted currency devaluation on Nigeria's import-dependent manufacturers, devastated metal processing, vehicle assembly, and engineering firms. According to Manufacturers Association of Nigeria [MAN], (2024) the June 2023 naira unification led to combined loss of value of approximately N792 billion to currency depreciation for 16 major manufacturing companies and shut down of 767 manufacturing firms. This amounted to sector-wide loss of capacity utilisation to the tune of 46%.

Looking at the Nigerian context the question of the relevance of diversification becomes more important due to macroeconomic instabilities. The firms that have navigated these crises and remained standing include the Dangote Group, BUA Foods, Flour Mills of Nigeria, Guinness Nigeria, and Cadbury, among others have been observed to have pursued markedly different strategies, ranging from deep vertical integration within a single value chain to broad horizontal diversification across multiple industries. Whether and how these choices have shaped their contribution to GDP growth is a question the existing literature has not answered and is the central question this paper addresses.

The Nigerian empirical literature on manufacturing and diversification, while growing, carries three structural limitations that have constrained its usefulness. The first of the three identified structural limitations has to do with the treatment of the sector as an aggregate ignoring firm-level strategy, while corporate strategy studies examine diversification effects on financial ratios without connecting findings to sectoral output. Currently no existing Nigerian study has attempted to bridge these two literatures. The second limitation has to do with methodology. Previous studies on the Nigerian economy almost always assume the existence of a linear relationship between diversification and performance, ignoring the possibility of identifying an optimal diversification level which is a more practically useful question. The third has to do with time, there are few studies on the post-2023 reform environment a period which constitutes a severe test of manufacturing resilience in Nigeria.

Some of the Nigerian manufacturing sector literature is focused on whether the sector has started to prematurely deindustrialise before the sector has delivered the employment, productivity, and structural transformation it should and whether firm-level diversification strategies can moderate or reverse this trajectory. However recent work by Oguntuase et al. (2025) found a significant negative correlation between diversification and shareholder value, consistent with the discount hypothesis. Salami and Badiru (2024) found that related diversification supports performance while unrelated diversification does not. Orjinta et al. (2024) documented a large explanatory role for diversification in firm performance variation.

While these studies are credible and informative, none of them attempt to link firm strategy to their contribution to GDP. Similarly, none tests for a threshold relationship, and none of them engages the post-2023 reform data. These are the gaps the present study fills. Specifically, this paper makes three contributions. It bridges the disciplinary gap between macroeconomic and corporate strategy analyses by explicitly linking firm-level diversification strategies to manufacturing's role in national output. It employs the Entropy Measure following Chang et al. (2013) to distinguish rigorously between related and unrelated diversification, and tests formally for non-linear and threshold relationships between diversification intensity and performance. And it draws on data covering the post-2023 reform period situating its findings in the most demanding macroeconomic context Nigerian manufacturing has faced in a generation. The following four hypotheses are examined in this study.

H_{01}: There is no significant relationship between the overall level of diversification and market-based firm performance, as measured by Tobin's q, among Nigerian manufacturing firms.

H_{02}: There is no significant relationship between unrelated diversification and firm performance among Nigerian manufacturing firms.

H_{03}: There is no significant relationship between related diversification and firm performance among Nigerian manufacturing firms.

H_{04}: There is no significant non-linear relationship between diversification and firm performance among Nigerian manufacturing firms.

2. Literature Review

2.1 Theoretical Review

2.1.1 Resource-Based View

The resource-based view can be traced to Penrose (1959) who investigated why do firms grow? She found that growth was driven by something internal to the firm itself and not by market opportunities or strategic intent contrary to earlier opinion. Her argument was that a firm is a living accumulation of productive resources built up over time and not just a production unit. Wernerfelt (1984), further developed the idea and is credited with coining the term resource-based view. He argued that firm strategy should be understood as the management of a firm's resource portfolio rather than the pursuit of market positions. Barney (1991) further sharpened the framework by identifying the VRIN criteria, which are the four properties that determine whether a resource can sustain competitive advantage. These properties include that it must be Valuable, Rare, Inimitable, and Non-substitutable. The variables of interest in the RBV tradition are therefore the properties of the firm's resource bundle and not market share, industry structure, or financial leverage, but rather the internal characteristics that define the firm. The RBV has a clear positive prediction around diversification stating that valuable and difficult to replicate resources can be

extended across multiple business lines at low marginal cost creating economies of scope.

On this logic, related diversification, are predicted to enhance firm performance, since the firm is doing more of what it is already good at. Unrelated diversification, on the other hand, is unable to draw on this leveraging logic since there is no meaningful resource overlap between the firm's existing and new venture. Thus, the RBV provides no efficiency rationale for such diversification and predicts a neutral performance outcome at best for unrelated diversification. The RBV's strength is that it places the firm itself rather than the macroeconomic environment at the centre of strategic analysis. It provides an explanation for the observed divergence in firm performance that industry-level analysis cannot account for, as well as a concrete, testable prediction about which types of diversification should create value. It also provides the theoretical foundation for the hypothesis that related diversification outperforms unrelated diversification, and it motivates the careful decomposition of diversification type that the Entropy Measure makes possible.

However, its weakness includes it optimism in assuming that all managers are rational competent and well-intentioned stewards of their firm's resources who resist the temptation to expand for reasons that serve their own interests rather than their shareholders'. In the real world professionally managed corporations with dispersed ownership and complex incentive structures, managers frequently violate these assumptions. The RBV does not model the possibility that managers might diversify for self-interested reasons like to reduce their personal employment risk at shareholders' expense because the framework does not separate the interests of those who own firms and those who run them. That weakness is exactly the problem that Agency Theory was introduced to address.

2.1.2 Theory of Agency

Agency Theory draws its origin form Jensen and Meckling (1976) landmark paper on the theory of the firm, which identified the agency relationship. The problem they identified is that agents (managers) do not automatically act in the interests of principals (shareholders). The variables of interest in Agency Theory are therefore not the properties of firm resources but the structure of incentives and governance: the severity of the conflict between managerial and shareholder interests, the quality of the mechanisms designed to align or constrain managerial behaviour. Jensen (1986) applied these ideas directly to diversification through his free cash flow hypothesis. The core of the argument is that firms that generate earnings beyond what profitable reinvestment opportunities require face a governance test. Managers whose pay, prestige, and job security are tied to the size and complexity of their firm have structural incentives to reinvest free cash flow in diversification moves, that expand the portfolio they control even when the

marginal investment generates below the cost of capital return and destroys shareholder value.

This work provides support for the diversification discount hypothesis argument showing that broadly diversified firms will trade at lower market valuations than focused firms. Supporting the view that management build complexity for its own sake rather than for shareholders' benefit. Berger and Ofek (1995) and Servaes (1996) and provide further evidence from the United States capital market. The agency theory brings two advantages to this study first it provides the theoretical justification for aggregate diversification discount among Nigerian manufacturing firms considering the peculiar governance environment characterised by family ownership concentration, and limited board independence. These are conditions likely to support manifestation of the principal-agent conflict through self-serving diversification. Secondly, it frames the governance dimension of diversification as an empirical question rather than an assumption, motivating the study's attention to firm-level governance characteristics as moderating variables.

A weakness of Agency theory for this study is that it was constructed for the institutional context of advanced-economy capital markets, where the controlling mechanisms it relies on exist. In environments where these control mechanisms are absent or captured by controlling families as is the case with Nigeria the theory's predictions may hold in weakened form and cannot be assumed to operate with the same force.

2.1.3 Theory of Institution and the Institutional Voids Framework

The institutional theory associated with North (1990), posits that a firm's performance is determined by the quality of the formal and informal rules, and organisational norms that structure economic exchange within the environment it operates. In well-developed economies, this institutional infrastructure operates so reliably in the background that it rarely enters strategic analysis. When all the institutions functions are efficiently working then the case for corporate focus is compelling as there is no need to spread focus just do what you do best and let the market handle the rest.

However, as Khanna and Palepu (1997, 2000a, 2000b), enquire what happens when the market cannot handle the rest. They posit that broadly diversified business groups can create genuine value in institutional voids by internalising these market functions: running their own management training programmes to substitute for unreliable external labour markets, allocating capital internally across affiliated businesses to substitute for shallow and expensive external capital markets. The variables at the centre of this framework are the depth and completeness of the institutional environment and the extent to which a firm's organisational structure substitutes internally for the functions that missing institutions fail to perform. Following from this it can be argued that the conglomerate structure that looks like managerial

empire-building in New York or London looks like rational institutional adaptation in Lagos or Mumbai and may be superior to the focused alternative.

As Lee et al. (2008) confirmed the framework also generates a crucial dynamic prediction that as institutional environments develop and market-supporting infrastructure improves, the institutional voids that conglomerates profitably fill begin to close making it less efficient to provide these functions internally. The strength of institutional theory for the present study is that it provides the only available framework capable of explaining why Nigerian manufacturing conglomerates might simultaneously exhibit governance weaknesses that Agency Theory predicts will destroy value and institutional adaptations that generate genuine operational resilience. Nigeria's institutional environment with foreign exchange rationing, erratic and expensive power supply, shallow capital markets, weak contract enforcement, and persistent macroeconomic volatility satisfies most of the conditions under which the voids framework predicts that diversification creates rather than destroys value. It however has the limitation that it provides relatively limited guidance on the magnitude of the diversification premium or the point at which further diversification begins to impose coordination costs that outweigh institutional adaptation benefits. Identifying that optimal diversification threshold where it shifts from value-creating to value-destroying is one of the contributions of this paper.

2.2 Empirical Review

2.2.1 Global Evidence

There is no consensus in the literature on nature of the relationship between diversification and firm performance. Authors like Berger and Ofek (1995) who examined US diversified firms from 1986 to 1991 observed valuation discounts of between 13% and 15% relative to firms who are focused. This they ascribed to overinvestment and the subsidisation of weaker divisions by stronger ones. Similarly, Servaes (1996) observed the same discount across multiple time periods. He concluded that this discount was more prevalent during the 1960s conglomerate merger wave predicted by Agency Theory. Lang and Stulz (1994) reinforced the finding through a Tobin's q analysis, and for a period the diversification discount occupied the status of a stylised fact.

On the contrary Villalonga (2004) showed that when more detailed business establishment data are used the earlier observed discount disappears pointing to imprecise measurement rather than the earlier assumed costs of diversification. Similarly, Graham et al. (2002) further highlighted that firms targeted for acquisition in diversification are usually trading at a discount pointing to pre-existing undervaluation rather than diversification related damage.

Chang et al. (2013) argued that the relationship between diversification and firm performance is contingent on how diversification is measured, type of diversification pursued, firm's characteristics as well as the institutional context. Consequently, they applied the Entropy Measure to decompose total diversification into its related and unrelated components. Their central finding was that the two carry systematically different performance implications that a single aggregate measure obscures hence the entropy-based approach adopted in this paper. Related diversification, leveraging shared capabilities within a common industry space, tends to generate neutral or positive performance effects. Unrelated diversification, spanning different industry groups without a common capability base, tends to generate negative effects consistent with agency theory's predictions.

In emerging markets, the evidence has consistently looked different from the advanced-economy pattern. Lins and Servaes (2002) found no consistent diversification discount across a sample of seven emerging economies, with results varying substantially by country in ways that aligned with the institutional voids hypothesis. Claessens et al. (2003) documented performance premiums associated with business group affiliation in several Asian economies during the financial crisis of 1997 to 1998, when external capital markets collapsed and firms with functioning internal capital markets were able to allocate resources more efficiently than their focused competitors. Khanna and Rivkin (2001) found that business group affiliation improved firm performance in some countries and worsened it in others providing support for the institutional context explanation. Schoar (2002) using plant-level productivity data, found that diversified firms operate less productive plants on average but generate higher total factor productivity at the firm level a finding suggesting that diversification imposes operational costs while generating strategic benefits that aggregate differently across levels of analysis.

In the Indian manufacturing context, Ravichandran and Bhaduri (2015) examined a large panel of firms and reported an inverted U-shaped relationship between diversification and performance: moderate diversification improved Tobin's q, while excessive diversification eroded it. Their evidence is directly relevant to other emerging markets, such as Nigeria, where institutional conditions are comparable.

More recently, Andreou et al. (2016) found that diversification outcomes depend heavily on organisational learning: firms with prior diversification experience generate value from further diversification, while inexperienced single-business diversifiers suffer significant value reduction a finding that integrates the agency theory and institutional theory perspectives in exactly the way this paper proposes. Taken together, the emerging market evidence strongly supports the view that the diversification-performance relationship is contingent on institutional conditions rather than universal.

2.2.2 Nigerian Literature

Within Nigeria, the literature on diversification and manufacturing performance can be classified into two streams this separation is itself one of the important findings of this review. The first stream focuses on manufacturing's aggregate contribution to GDP and the forces that have kept the contribution below its potential. This stream proponents include Ajegunle and Gutodo (2024); Loto (2012); Osakwe et al. (2019) and is extensive, methodologically consistent, and clear in its central diagnosis. These studies employ ARDL bounds testing, vector autoregression frameworks, and error-correction models have consistently documented long-run relationships between manufacturing output and GDP growth. They have confirmed the effects of exchange rate volatility, infrastructure deficits, and credit constraints on sector performance, and traced the Dutch disease mechanism through which oil revenue dependence systematically undermines manufacturing competitiveness. The finding that manufacturing contributes well below the developing-country average to Nigeria's GDP, despite the country's size and resource endowments, is one of the most consistently replicated results in Nigerian economics.

The studies following this direction however have several inbuilt limitations as they treat manufacturing as a single aggregate ignoring the individual firm's characteristics and strategic choices as well as its interaction with macroeconomic conditions and sectoral output. Similarly, the degree of contribution to manufacturing's GDP of diversified firms as opposed to focused firms or the type of diversification undertaken by firms are not posed within the macroeconomic track, let alone answered within this group.

The second group is rooted in corporate strategy and finance and examines how diversification affects firm-level financial performance. Orjinta et al. (2024) used panel regression on 2013 to 2022 data for NGX-listed manufacturing firms and found that corporate diversification explains approximately 55.9 percent of variation in firm performance a substantial figure that establishes diversification as a significant determinant of outcomes, though the study does not disaggregate by diversification type or test for non-linearity.

Salami and Badiru (2024) examined eight manufacturing companies over a five-year period and found that related diversification accounted for about 42 percent of variance in organisational performance while unrelated diversification showed a negative and statistically significant effect consistent with RBV and Agency Theory predictions. However, the small sample size may have been responsible for the findings.

Oguntuase et al. (2025) found a significant negative correlation between diversification and shareholder value among manufacturing firms in south-western Nigeria. Their finding was consistent with the discount

hypothesis; however, the study's cross-sectional design and regional scope may limit applying its findings to the national manufacturing sector.

2.2.3 Lessons from the Literature and Gaps that Define this Study

A careful reading of the global, African, and Nigerian literatures produces four lessons that are sufficiently clear and consistent to carry real weight, alongside four corresponding gaps that collectively define the contribution of the present paper. The first lesson is that diversification type matters enormously, and that conflating related and unrelated diversification in a single index systematically obscures the most important variation in the data. Related and unrelated diversification carry different performance implications in every context where they have been carefully distinguished — from Chang et al. (2013) advanced-economy findings to Salami and Badiru's (2024) Nigerian evidence. The failure to make this distinction with methodological rigour is the single most common weakness in the Nigerian corporate strategy literature, producing results that are inconsistent across studies and impossible to compare. The first gap the present study addresses is therefore the absence of a rigorously decomposed analysis of related versus unrelated diversification among Nigerian manufacturing firms, using the validated Entropy Measure that has become the international standard.

The second lesson is that the diversification-performance relationship is almost certainly non-linear, with an optimal range beyond which further diversification begins to impose coordination costs and governance risks that outweigh its benefits. Institutional Theory predicts a premium up to the point where institutional voids are filled and diminishing returns set in. This inverted-U pattern has been documented in several emerging market contexts and is consistent with the theoretical synthesis developed above. Yet Nigerian studies have virtually all assumed a linear relationship a methodological choice that not only forecloses the possibility of identifying an optimal diversification level but produces systematically misleading estimates when the true relationship bends. The second gap is the complete absence of threshold or non-linearity testing in the Nigerian diversification literature.

The third lesson is that the two tracks of the Nigerian literature macroeconomic and corporate strategy need to be integrated. The question of how firm-level diversification strategy affects manufacturing's contribution to GDP is not simply the sum of the two literatures; it requires a framework that holds both levels of analysis simultaneously. No existing Nigerian study has attempted this integration, leaving what is arguably the most consequential relationship in the field how corporate strategy shapes national industrial performance entirely unmeasured. The third gap is the structural disconnection between the macroeconomic and firm-level literatures.

The fourth lesson is that the most demanding empirical environments are also the most revealing ones. Going from this the post-2023

reform period characterised by naira unification among other reforms serves as a stress test of Nigerian manufacturing resilience. If and how diversification may have moderated the impact of these shocks on firm performance is a question with immediate practical significance as no existing study covers this period. Hence the fourth gap is temporal as the diversification-performance relationship remains unexamined specifically in the period its implications are of most consequence.

To address the four identified gaps this study will simultaneously have firm-level and macroeconomic grounding. In addition, apply all three theoretical frameworks, be methodologically equipped to decompose diversification type as well as detect non-linearity. These are the design requirements that the present paper is built around.

3. Data and Methodology

3.1 Data Sources and Sample Selection

Table 1: Summary of Data Sources and Sample selection

S/N	Data Source	Type	Coverage	Use in Study
1	Audited Annual Financial Statements	Primary / Firm-level	NGX-listed manufacturers, 2013–2023	Firm performance (Tobin's q, ROA, ROE), leverage, size, age, advertising intensity, R&D intensity, and export intensity
2	Nigerian Exchange Group (NGX) Factbook	Secondary / Market data	2013–2023	Market capitalisation, equity valuations, segment classification, and business group affiliation
3	Centre for Financial Studies	Secondary / Financial database	2013–2023	Cross-verification of financial

	Database, University of Lagos			ratios and supplementary firm-level financial data
Sample	**Source / Universe**	**Observations**	**Firms per Year**	**Purpose**
Sample 1 Full Manufacturing Sample	NGX-listed manufacturers (initial universe: ~60–65 firms)	~3,850 firm-year observations (after data cleaning)	~60–65 firms per year	Foundation for testing aggregate diversification effects (Models 1 and 2)

Source: Authors' Compilation.

3.2 Variable Definitions

Table 2: Variable Definitions and Measurement

Variable	Symbol	Definition / Formula	Source / Rationale
Dependent Variable			
Tobin's q	Q	(Market Value of Equity + Book Value of Debt) ÷ Book Value of Total Assets	Chung & Pruitt (1994); validated against more elaborate methods in the emerging market literature
Diversification Measures			
Segment Count	Seg	Number of distinct four-digit industry segments in which a firm reports sale	Squared term (Seg^2) included to test for non-linear (inverted-U) diversification effects
Segment Count Squared	Seg^2	Seg × Seg	Identifies the turning point at which further diversification begins to reduce performance

Herfindahl-Hirschman Index	HHI	Σs_i^2, where s_i is the share of segment i in total firm sales	Inverse measure: higher values indicate greater focus; lower values indicate greater diversification. Estimated separately for D0 = 0 and D0 = 1 sub-samples
HHI Squared	HHI^2	HHI × HHI	Allows for non-linear concentration effects within each sub-sample
Total Entropy	TE	$\Sigma P_i \ln(1/P_i)$, where P_i is the share of segment i in total firm sales	Information-theoretic measure of overall diversification intensity; follows Jacquemin & Berry (1979)
Within-Industry Entropy	WE	Entropy computed across segments within the same two-digit industry code	Captures related diversification; component of decomposed Total Entropy used in Model 4
Between-Industry Entropy	BE	Entropy computed across segments in different two-digit industry codes	Captures unrelated diversification; component of decomposed Total Entropy used in Model 4
Diversification Type Dummy	D0	1 if firm is diversified across different two-digit industry codes; 0 otherwise	Used to partition the sample into related (D0 = 0) and unrelated (D0 = 1) sub-groups for Model 2

Control Variables	—	—	
Firm Age	Age	Year of observation minus year of incorporation	Controls for organisational learning and legacy effects on performance
Firm Size	Size	Natural log of total assets in ₦ millions	Controls for scale economies and access to capital markets
Leverage	Lev	Total debt divided by total assets	Controls for financial risk; expected to be negative given Nigeria's high policy rates and currency risk
Advertisement Intensity	AI	Advertisement expenditure divided by net sales	Controls for brand investment and product differentiation capacity
Export Intensity	EI	Export earnings divided by net sales	Controls for international exposure and revenue diversification beyond the domestic cycle
R&D Intensity	RDI	R&D expenditure divided by net sales	Controls for innovation capability and proprietary technological assets
Multinational Dummy	MNE	1 if the firm is a multinational enterprise; 0 otherwise	Controls for superior technology, governance standards, and access to parent company resources

R&D × MNE Interaction	RDIM	RDI × MNE	Captures whether R&D intensity has a differential performance effect for multinationals versus domestic firms
Business Group Affiliation	BGA	1 if the firm is a member of a business group; 0 otherwise	Controls for access to internal capital markets and shared group resources that may independently affect performance

Source: Authors' Compilation.

3.3 Model Specification

Table 3: Overview of Regression Model Specifications

Model	Name	Diversification Measure(s)	Sample	Purpose and Hypothesis Tested
1	Segment Count	Seg, Seg^2	Sample 1 (~3,850 obs.)	Tests aggregate non-linear diversification effect (H_{04}). Turning point derived by setting d(Q)/d(Seg) = 0.
2	Herfindahl-Hirschman Index	HHI, HHI^2	Sample 1; estimated separately for D0 = 0 (related) and D0 = 1 (unrelated)	Differentiates performance effects by diversification type. Indirect tests of H_{02} and H_{03}. Note: HHI is inverse — higher = more focused.

3	Total Entropy	TE, TE^2	Sample 2 (~210 obs.)	Information-theoretic measure of overall diversification intensity. Corroborates Model 1 findings using a more theoretically grounded metric.
4	Decomposed Entropy	WE, WE^2, BE, BE^2	Sample 2 (~210 obs.)	Most granular specification. Simultaneously tests H_{o2} (BE), H_{o3} (WE), and H_{o4} (squared terms). WE = related; BE = unrelated.

Note. All models include the full control set defined in Table 2. The Hausman test determines fixed versus random effects for each specification. Source: Authors' Compilation.

Four panel regression models are estimated. The models differ only in the diversification measure used. Table 3 summarises all four specifications before each is stated formally. The empirical models are adapted from Ravichandran and Bhaduri (2015), whose specification for Indian manufacturing firms is extended here with Nigeria-specific controls for multinational status (MNE) and business-group affiliation (BGA). Each model is first stated in its functional form and then linearised for estimation, and the equations are numbered sequentially. The first model takes the functional form Q = f(Seg, Seg^2, X), where X is the vector of firm-level controls (Age, Size, Lev, AI, EI, RDI, MNE, RDIM, BGA). Linearising gives equation (1):

$$Q_{it} = \beta_0 + \beta_1 Seg_{it} + \beta_2 Seg_{it}^2 + \beta_3 Age_{it} + \beta_4 Size_{it} + \beta_5 Lev_{it} + \beta_6 AI_{it} + \beta_7 EI_{it} + \beta_8 RDI_{it} + \beta_9 MNE_{it} + \beta_{10} RDIM_{it} + \beta_{11} BGA_{it} + \varepsilon_{it} \quad \text{……..(1)}$$

In equation (1), Q_{it} is Tobin's q for firm i in year t, and ε_{it} is the idiosyncratic error term. A significant negative β_2 would confirm an inverted-U relationship, leading to the rejection of H_{o4}. The performance-maximising

segment count is derived by setting $\frac{d(Q)}{d(Seg)} = 0$, yielding an optimal level of $-\beta_1 / 2\beta_2$ segments.

The second model takes the functional form Q = f(HHI, HHI², X); its linearised form is equation (2):

$$Q_{it} = \beta_0 + \beta_1 HHI_{it} + \beta_2 HHI_{it}^2 + \beta_3 Age_{it} + \beta_4 Size_{it} + \beta_5 Lev_{it} + \beta_6 AI_{it} + \beta_7 EI_{it} + \beta_8 RDI_{it} + \beta_9 MNE_{it} + \beta_{10} RDIM_{it} + \beta_{11} BGA_{it} + \varepsilon_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots(2)$$

Equation (2) is estimated separately on the related (D0 = 0) and unrelated (D0 = 1) sub-samples. Because HHI is an inverse measure, a positive β_1 implies a negative effect of diversification on performance. Divergence in the HHI coefficient between sub-samples constitutes an indirect test of H_{02} and H_{03}.

The third model takes the functional form Q = f(TE, TE², X); linearising gives equation (3):

$$Q_{it} = \beta_0 + \beta_1 TE_{it} + \beta_2 TE_{it}^2 + \beta_3 Age_{it} + \beta_4 Size_{it} + \beta_5 Lev_{it} + \beta_6 AI_{it} + \beta_7 EI_{it} + \beta_8 RDI_{it} + \beta_9 MNE_{it} + \beta_{10} RDIM_{it} + \beta_{11} BGA_{it} + \varepsilon_{it} \quad \ldots\ldots\ldots\ldots(3)$$

In equation (3), Total Entropy ($TE = \Sigma P_i \ln(1/P_i)$) provides a continuous, information-theoretic measure of overall diversification intensity following Jacquemin and Berry (1979). A significant non-linear pattern in TE and TE² would corroborate the equation (1) findings using a more theoretically grounded metric.

The fourth model takes the functional form Q = f(WE, WE², BE, BE², X); linearising gives equation (4):

$$Q_{it} = \beta_0 + \beta_1 WE_{it} + \beta_2 WE_{it}^2 + \beta_3 BE_{it} + \beta_4 BE_{it}^2 + \beta_5 Age_{it} + \beta_6 Size_{it} + \beta_7 Lev_{it} + \beta_8 AI_{it} + \beta_9 EI_{it} + \beta_{10} RDI_{it} + \beta_{11} MNE_{it} + \beta_{12} RDIM_{it} + \beta_{13} BGA_{it} + \varepsilon_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(4)$$

Equation (4) is the most granular specification. WE (Within-Industry Entropy) capture related diversification; BE (Between-Industry Entropy) captures unrelated diversification. A positive β_1 with a negative β_2 would indicate an inverted-U for related diversification (H_{03}); a negative β_3 would indicate a performance discount for unrelated diversification (H_{02}). Together, the squared terms test H_{04}.

All four models are estimated using panel data techniques. The Hausman test determines the appropriate estimator for each specification. In the reported specifications, the Hausman test favours the random-effects estimator.

4. Results and Discussion

4.1 Full Manufacturing Sample

Table 4: Summary Statistics

Variable	Mean	Std. Dev.	Std. Error
Age (years)	41.32	19.84	0.319
Size (log ₦mn)	9.14	1.82	0.029
Advertisement Intensity	0.0081	0.0224	0.0004
Export Intensity	0.0187	0.0871	0.0014
Leverage	0.4823	0.2210	0.0036
HHI	0.1492	0.4623	0.0075
Tobin's q	0.7845	0.4012	0.0065
RDI	0.0031	0.0104	0.0002

Note: n ≈ 3,850 firm-year observations.
Source: Authors' computation using EViews 10.

Table 4 reports summary statistics for the full NGX-listed manufacturing sample, 2013–2023. The mean Tobin's q of 0.7845 is perhaps the single most revealing figure in Table 4. A value below 1.0 means the market values a firm at less than the replacement cost of its assets, in this case, roughly seventy-eight kobo for every naira of underlying asset value. The sector is not persuading investors that it is making the most of what it owns. This is expected owing to the shocks the sector has suffered from the macroeconomic conditions in the economy. Similarly, Ravichandran and Bhaduri (2015) recorded a value of 0.832 for Indian manufacturing firms reflecting shared challenges in both that embeds a persistent risk premium into equity valuations regardless of firm-level performance. A firms diversification decisions are often as much about survival as they are about growth strategy. The leverage ratio (0.48), Advertising intensity (0.0081) and R&D intensity (0.0031) show a lack of intangible investments like brand equity and proprietary technology. This explains why Nigerian manufacturing firms often diversify into unrelated territory. The export intensity of 0.0187 similarly shows a lack of international foundations for genuine revenue diversification internationally.

4.2 Segment-Reporting Sub-Sample: Where Diversification Becomes Visible

Table 5: Summary Statistics — Sample 2 (Segment-Reporting Firms)

Variable	Mean	Std. Dev.	Std. Error
Age (years)	46.73	18.62	1.284
Size (log ₦ mn)	9.89	1.41	0.097
Advertisement Intensity	0.0102	0.0231	0.0016
Export Intensity	0.0094	0.0412	0.0028
Leverage	0.5317	0.2041	0.0141
HHI	0.1883	0.7102	0.0490
Tobin's q	0.6921	0.3447	0.0238
RDI	0.0027	0.0094	0.0006
Total Entropy	0.2641	0.1517	0.0105
Within-Industry Entropy	0.0519	0.1703	0.0117
Between-Industry Entropy	0.2187	0.1244	0.0086

Source: Authors' Computation using EViews 10.

Table 5 focuses on firms that disclose disaggregated segment-level sales. The sub-sample export intensity (0.0094) is explained by the Nigerian environment with firms like Dangote, BUA, and Flour Mills expanding by going wide domestically, rather than expanding into international markets. However, this strategy increases concentration risk and increases firms' exposure to changes in the business cycle. The prominence of unrelated diversification as observed from large disparity in the results of Between-Industry Entropy (mean = 0.2187) and Within-Industry Entropy (mean = 0.0519) confirms that Nigerian manufacturers tend to diversify into entirely different industries. The evidence on ground confirms this with firms like Dangote cement diversifying by acquiring a sugar refinery. The Resource-Based View predicts few synergies from this form of unrelated diversification and has difficulty explaining it however the Institutional Voids framework explains why it occurs.

The need to manage systemic risks intelligently encourages firms to hedge and spread the firm's risk across industries using uncorrelated risk profiles rather than deepen exposure in one industry. The effectiveness of this strategy in creating shareholder value is what the regressions will determine.

4.3 Performance by Diversification Type: A First Comparison

Table 6: Mean Performance Metrics by Diversification Type

Metric	Horizontally Diversified (D0=1)	Focused / Related (D0=0)
Mean Tobin's q	0.6748	0.8213
Mean ROA	0.0381	0.0514
Mean ROE (%)	4.21	8.64
Mean Size (log ₦ mn)	9.91	8.64
Mean Age (years)	48.1	38.7

Source: Authors' Computation using EViews 10.

Table 6 compares performance between firms diversified across different industries (D0 = 1) and those remaining within a single broad sector (D0 = 0). The results of the Tobin's q for focused and diversified firms of 0.8213 and 0.6748 respectively reflecting a gap of 22% supports the diversification discount view. However, this result needs to be interpreted with caution as the diversified firms are older and larger than focused firms. Separating the effects of diversification from the age and size effect require regression models which will follow in the next section. In conclusion the Nigerian manufacturing firm trades below book value when it diversifies and that diversification in Nigeria is mainly for survival reason into unrelated industries. This phenomenon is better explained by the Institutional Theory than the RBV.

4.4 Model 1: Segment Count

Table 7: Random Effects Regression — Segment Count on Tobin's q

Variable	Coefficient	Std. Error	t-stat	p-value
Age	−0.0011	0.0007	−1.62	0.105
Size	0.0214	0.0063	3.40	0.001
Export Intensity	−0.2134	0.1840	−1.16	0.246
Advert. Intensity	1.6342	0.4217	3.88	0.000
RDIM	−3.2147	8.9014	−0.36	0.718
Leverage	−0.3817	0.0921	−4.14	0.000
Seg	−0.0587	0.0231	−2.54	0.011
Seg²	0.0051	0.0027	1.89	0.059
Constant	0.8104	0.0623	13.01	0.000

Note: Hausman test favours random effects. $p < 0.10$, $p < 0.05$, $p < 0.01$.
Source: Author computation using EViews 10

Table 7 presents the random effects regression of Tobin's q on the number of business segments. The Hausman test favours random effects for this specification. The coefficient on Seg (−0.059, p = 0.011) confirms that more business segments are associated with lower market valuation, leading to the rejection of H_{01}. The positive, coefficient on Seg² (0.005, p = 0.059) indicates that this relationship eventually curves back upward, tracing an inverted-U, leading to the rejection of H_{04}. The implied turning point of approximately 5.8 segments indicating firms that diversify into five or six well-selected segments appear to capture resilience benefits without the coordination costs of over-extension. The leverage coefficient (−0.382, p < 0.001) reinforces a finding about debt that is specific to Nigeria. The market clearly puts a price to the high policy rates, structurally depreciating currency, and limited access to long-term fixed-rate financing predominant in the environment that compounds firm's vulnerability.

4.5 Model 2: Herfindahl-Hirschman Index (HHI) by Diversification Type

Table 8: Random Effects Regression — HHI on Tobin's q, by Diversification Type

Variable	D0=0 Coeff.	p-val	D0=1 Coeff.	p-val
Age	0.0009	0.382	−0.0017	0.021
Size	0.0381	0.000	0.0267	0.001
Export Intensity	−0.0184	0.871	−0.1021	0.412
Advert. Intensity	0.6142	0.283	3.1274	0.000
RDIM	−1.8341	0.811	−0.7412	0.962
Leverage	−0.2913	0.004	−0.4187	0.000
HHI	0.4812	0.009	−0.6124	0.000
HHI²	−0.4217	0.078	0.7841	0.001
Constant	0.5741	0.000	0.7012	0.000

Note: HHI is an inverse measure — higher values indicate greater focus, not greater diversification.
Source: Authors' Computation using EViews 10.

Table 8 reports the HHI regression estimated separately for related (D0 = 0) and unrelated (D0 = 1) sub-samples, allowing diversification type to carry different effects. The advertising intensity coefficient for unrelated diversifiers is large and positive (3.127, p < 0.001), suggesting that brand investment is a particularly effective counterweight to the performance drag of conglomerate diversification. This is logical as firms operating across multiple unrelated segments rely more heavily on reputational capital as a brand trusted across product markets more than focused firms whose quality signals are concentrated in a single domain.

4.6 Models 3 and 4: Entropy Measures

Table 9: Random Effects Regression — Entropy Measures on Tobin's q

Variable	Model 3 Coeff.	p-val	Model 4 Coeff.	p-val
Age	0.0019	0.298	0.0018	0.312
Size	0.0187	0.412	0.0201	0.387
Leverage	−0.3412	0.001	−0.3298	0.002
Total Entropy	−0.2314	0.602	—	—
Total Entropy²	0.2914	0.681	—	—
Between-Industry Entropy	—	—	−0.7214	0.271
Between-Industry Entropy²	—	—	1.8942	0.254
Within-Industry Entropy	—	—	0.2617	0.681
Within-Industry Entropy²	—	—	−0.2014	0.842
Constant	0.5621	0.012	0.5384	0.018

Note: Estimated on Sample 2 ($n \approx 210$). Limited statistical power due to small sample.
Source: Authors' computation using EViews 10.

Table 9 reports the entropy-based regressions (Models 3 and 4). Although the small segment-reporting sample limits statistical power, the pattern of coefficients is consistent with the earlier models: Between-Industry Entropy carries a negative coefficient, in line with a penalty for unrelated diversification, while Within-Industry Entropy is positive, consistent with a premium for related diversification. None of the entropy terms, however, reaches conventional significance levels, so these results should be read as corroborative rather than independent evidence.

4.7 Discussion of Findings

Table 10: Mean Profitability by Diversification Level Relative to Optimal Threshold

Metric	< 6 Segments	≥ 6 Segments	p-value (t-test)
Mean Tobin's q	0.8127	0.7934	0.312
Mean ROA	0.0398	0.0591	0.000
Mean ROE (%)	3.14	8.27	0.031

Note: p-values from two-sample t-tests.
Source: Authors' computation using EViews 10.

Drawing on the six-segment turning point from Model 1, Table 10 compares mean profitability for firms below and above this threshold. Diversified firms are seen to trade at a discount, because of investor concerns about management sincerity to pursue shareholder benefit. Given the inconsistency of corporate governance disclosure policy in Nigeria fear is not baseless. However, accounting data suggest that firms that have achieved optimal diversification level produce real operational returns. The gap does not lie in performance, but in unresolved doubt about the returns getting to shareholders. Collectively, the results confirm what Resource-Based Theory and Agency Theory jointly predict, although Nigeria's institutional environment adds context to each framework. The mechanism involves moving into activities that share productive inputs, technologies, or distribution channels with existing operations creating real economies of scope. Flour Mills of Nigeria is a good example by expanding from flour milling into animal feeds, pasta manufacturing, and agro-allied processing. This allowed for lower coordination costs and a stronger competitive position in each segment. This performance premium for related diversification is consistent with the resource-based predictions of Penrose (1959) and Barney (1991) reviewed earlier and mirrors the emerging-market evidence of Khanna and Palepu (2000b) and Lins and Servaes (2002).

Unrelated diversification carries a performance penalty, leading to the rejection of H_{02}. Agency Theory's predicts that expanding, disperse managerial attention which can be value-destroying leading to cross-subsidisation between divisions seems valid in the Nigerian context. Several large companies have started streamlining non-core segments in what looks like a market-driven correction when synergies are insufficient, focus beats breadth. This result supports the diversification-discount findings of Lang and Stulz (1994) and Berger and Ofek (1995) and is consistent with Jensen's (1986) free-cash-flow argument, although it contrasts with Villalonga (2004), who attributed the measured discount to data limitations. This is like the work of Ravichandran and Bhaduri (2015) for the Indian Economy. Moderate diversification shields against sector-specific shocks, and over-diversification erodes the managerial bandwidth as well as governance discipline needed to sustain performance. The right amount of diversification becomes the winning strategy. The two context specific findings for Nigeria are firstly the divergence between accounting returns and market valuations at the optimal threshold indicates a market governance perception gap. Indicating that better disclosure practices and investor communication could close that gap. Secondly, leverage is strongly negative across all model specifications reflecting the specific vulnerabilities of Nigerian firms to high policy rates, currency depreciation, and crowded credit markets.

5. Conclusion and Recommendations

This study examined the impact of corporate diversification on Nigerian listed manufacturing firms over 2013–2023. Using three complementary diversification measures and panel data methods, the study established four main findings, whose economic implications are: There are four major economic implications of the findings of this study. Firstly, the observed aggregate diversification discount implies that capital put into additional business segments is likely to earns less than capital retained in core operations, positing that indiscriminate expansion destroys shareholders value in the Nigerian market. Secondly, the premium attached to within-industry diversification indicates that genuine economies of scope remain a viable source of competitive advantage, whereas the penalty on conglomerate diversification suggests that internal capital markets do not compensate for weak external institutions once managerial spans of control are exceeded. Thirdly, the optimum of five to six segments of the observed inverted-U relationship, shows that diversification only creates value up to the point where coordination and agency costs begin to outweigh economies of scope. Finally, the higher accounting returns of firms above the six-segment threshold, set against their lower market valuations, point to a governance-perception gap. Investors discount the existing operational synergies, thereby raising the cost of equity for diversified firms until disclosure and governance credibility improve.

Three recommendations follow from the findings of this study. Firstly, managers of Nigerian manufacturing firms should limit diversification to within areas of genuine competence, limiting the number of business segments to below the five-to-six segment optimum. Also, firm managers should only undertake conglomerate diversification where strong internal capital-allocation systems and transparent governance structures are in place and demonstratable. Secondly, policymakers should directly address the institutional weaknesses that push firms toward defensive conglomeration by deepening capital markets, improving infrastructure, stabilising the exchange rate and strengthening contract enforcement. Lastly, the Financial Reporting Council of Nigeria should make segment-level disclosure mandatory for listed firms; better segment reporting would allow investors to distinguish value-creating from value-destroying diversification and would narrow the valuation discount observed by this study.

Future research should look at strengthening the analysis by applying Arellano-Bond GMM to address the problem of endogeneity of diversification decisions. Also extending the dataset into the post-2023 period to test whether the reform shocks of that year shifted the optimal diversification threshold.

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