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Nonlinear Effects of Geographic Diversification on Firm Performance with the Moderating Influence of Intangible Assets

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Abstract – The concepts of geographic diversification and firm performance are central to the study of corporate strategy in a world economy. This research aims at establishing the nature of the relationship between the two variables, with the moderating effect of intangible assets including research and development and advertising intensity. Using a robust dataset of 2,067 firms, we tested two hypotheses: first, that the relationship is curvilinear, conforming to an S-shape, and second, that the presence of high intangible assets improves the performance return from geographic dispersion. These results indicate that both low and high amounts of geographic diversification are detrimental to firm performance; however, moderate levels of geographic diversification produce marked enhancements in ROA and Tobin's Q. Consequently, when internationalization is low, the performance decreases to 0.35 below the base level in Tobin's Q; and moderate internationalization of up to 0.2 leads to a high increment of 0.501 in Tobin's Q, which is 40% improvement. However, if the level of internationalization goes beyond this threshold, the link between the extent of performance and internationalization is negative. The interaction effects reveal that internationalization increases the performance of firms with greater advertising and R&D intensities by 20% when advertising intensity increases from 2% to 4% at an internationalization level of 0.7 of Tobin's Q.

Keywords – Geographic Diversification, International Diversification, Firm Performance, Intangible Assets, Internationalization, Geographical Expansion Decisions.

I. INTRODUCTION

A company with profit-generating domestic capabilities will pursue further revenues in overseas markets. If these skills are integrated into the firm's structure, worldwide markets will be internalized via foreign direct investment, optimizing the use of these capabilities while safeguarding them against compromise. Provided that the ownership considerations can be used economically, the business will broaden its worldwide reach. Connelly et al. [1] proposed that this growth might be constrained by relatedness factors across regional markets, similar to the extension of product breadth. Proponents of internationalization models [2] assert that experience in foreign markets enables enterprises to incrementally enhance their commitment to worldwide growth. The capacity to oversee vast networks of global subsidiaries with little transactional expenses seems to be a crucial competency of successful multinational corporations. International diversification may encounter governance cost constraints for a certain organization at a particular moment; nevertheless, these constraints broaden with experience as management competencies increase. The correlation and nonlinearity between regional variety and performance may be context-specific.

The correlation between firm performance and international diversification has been a significant subject of inquiry for scholars in international business and strategic management [3]. International diversification refers to a company's development outside its domestic boundaries into other nations and geographical locations. Terms like international diversification, multinationalism, and global diversity are typically employed interchangeably in scholarly literature. The

significance of international diversification stems from its role as a growth strategy with substantial potential to influence corporate performance. Numerous research investigating the relationship between multinationalism and performance have shown contradictory findings [4]. Companies with robust skills developed domestically may leverage them in global markets. It is posited that increased engagement of a corporation in foreign markets correlates with greater use of tangible and intangible resources, anticipated to enhance performance [5]. This perspective is fundamentally grounded in the knowledge- or resource-based perspective of the company within strategic management and in internalization theory from the FDI-focused international business literature. Moreover, multinational corporations may enhance cross-border integration by standardizing goods, optimizing manufacturing, and allocating resources more economically and effectively. Moreover, multinational corporations can secure further competitive rivalry by capitalizing on cross-border communications (transfer pricing) and market inadequacies (less competitive landscape), while also enhancing their bargaining power through increased scale. All of these considerations support the perspective that a more positive, linear correlation exists between performance and international diversity.

Investigations studying the correlation between geographic scope and performance have shown more definitive findings than those examining product diversification and performance. Most research investigating geographic scope and firm performance contend that the enhanced performance of a multinational enterprise (MNE) arises from its capacity to achieve better returns by using proprietary assets, like as patents, corporate equity or distinctive processes, across a broader array of markets. Benefits also arise from enhanced market power, the capacity to get cheaper inputs, and the distribution of risk across many host nation environments. The use of intangible asset advantages in international markets is facilitated by market imperfections in the exchange of these assets. Thus, multinational corporations exploit market inefficiencies by internalizing the asset market, resulting in superior profits when the asset is used in foreign markets [6]. Theories of multinational enterprises do not delineate boundaries for the ideal global reach of a corporation, while some data suggests diminishing returns at extensive levels of multinational operations. A consistently favorable correlation has been established between performance and geographic scope.

This paper seeks to examine the interaction between firm performance and geographic diversification where the moderating variables are advertising intensity and R&D. Using a dataset of 2,067 firms, we tested two hypotheses: that the connection is the S-curve and that higher level of intangible resources improve the geographic diversification's performance benefits. We find that both low and high internationalization have negative implications on business performance while moderate internationalization has a positive effect on Tobin's Q of up to 40%. Third, it is found that advertising intensity and R&D has a positive implication on business performance, which proves that intangible resources play an important part in the geographic expansion strategies. The rest of the article has been organized as follows: Section II provides an overview and hypothesis of the research. It describes the benefits and costs of geographic diversification; and provides a description between firm performance and geographic diversification. Section III identifies the samples collected, variables, analytical approach, as well as robustness checks employed in our research. Section IV and V provides a detailed account of the results obtained. Section VI shedding light on the confusion of prior studies regarding the strategic geographic expansion decisions with high and low returns on intangible assets.

II. OVERVIEW AND HYPOTHESES

Benefits from Geographic Diversification

Amit and Livnat [7] examined the correlations between economic performance, organizational structure, and diversification strategy concluding that associated diversification techniques serve as positive metrics of market value, risk, profitability, and growth. A study in [8] ascertained the influence of organizational structure, R&D intensity, compensation, diversification management, promotional intensity, change management processes, monitoring intensity, regulatory environment, firm size and age, and industrial growth stage on performance. Unrelated diversification mostly depends on control/managerial and financial abilities that are not explicitly aligned with the crucial success determinants of a particular market. Until recently, there has been a significant deficiency of research examining performance difficulties related to diversification strategies. The formation of alliances encounters difficulties with opportunism and incorporates a significant learning element as a measure of performance. Acquisitions rely on financial returns due to the premiums paid, making profit, growth, and operational integration key performance factors.

Costs Related to Geographic Diversification

While companies diversifying into related sectors might gain from intra-temporal scope economies, Dyer [9] asserts that the resources' joint ownership is effective solely whenever the transaction expenses associated with separate ownership, stemming from opportunism and contracting expenses, could be mitigated using internal control or organization. Diversification in relation to the scope economies has to only happen when the internal organization costs are lower than transaction costs associated with market generation in distinct entities, since internalizing transactions incurs costs. In the following study, consider that transaction costs criteria for the joint production's internal structure have been met. The principle of scope economies delineates the advantages of relevant diversification in relation to cost efficiencies. The benefits obtained from scope economies may also be articulated in relation to demand-side gains associated with outputs (services and products) instead of expenditures.

Geographic Diversification and Firm Performance

Zahra and Garvis [10] identified a favorable correlation between foreign diversity and corporate success. This link may be elucidated by many factors. The authors contended that international diversity contributed to the stabilization of returns. The authors' results suggested that the stability of returns or risk mitigation was not a key motivation for international diversification. Singh [11] contended that investors get returns because, owing to knowledge asymmetries, they are unable to derive equivalent advantages from personal investments in local and foreign markets. Nonetheless, the increasing capacity for information exchange across global markets may diminish knowledge asymmetries, thereby lessening the advantages of international diversity. Moreover, international diversification may provide additional advantages, as Levy and Sarnat [12] shown that it generates substantial returns with little risk.

International diversification may provide a corporation with opportunity to capitalize on the advantages of doing additional operations domestically. It facilitates the use of interconnections across business segments, geographic regions, or enterprises within connected industries. Bruneel, Yli-Renko, and Clarysse [13] contended that international diversification yields economies of scale, breadth, and/or experiential learning. The scholars contended that multinational corporations that successfully integrate on a global scale, by standardizing products, optimizing production, and coordinating essential resource functions such as research and development, can attain optimal economic scale and distribute investments in key functions such as R&D over a wider base. The authors previously observed that such enterprises may achieve competitive advantage by using disparities in national resources, flexibility and negotiating leverage derived from a worldwide network, as well as economies of scale, breadth, and learning. Therefore, attaining the advantages of international diversification necessitates integration, namely the coordination of resource flows across national boundaries and product markets.

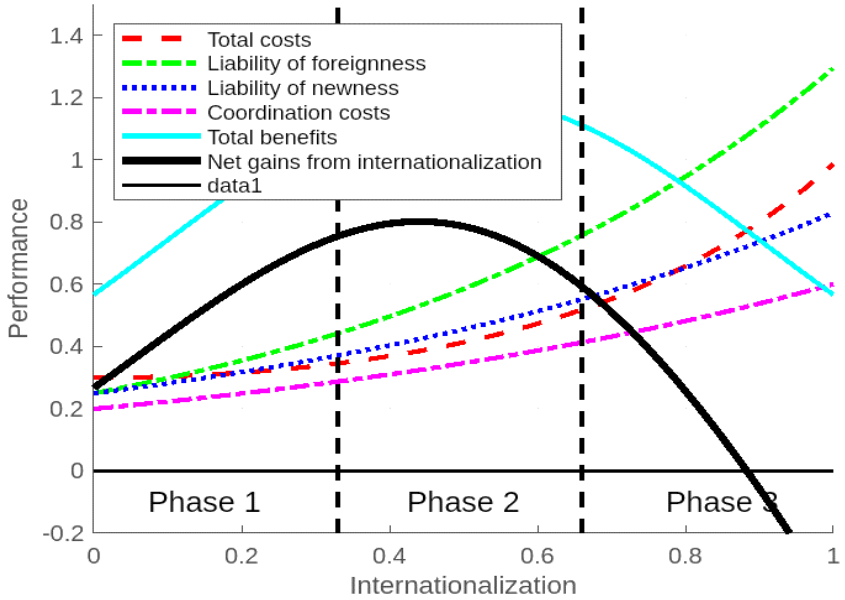

Fig 1. Performance and Multinationalism: A Three-Phase Model

The aforementioned analysis delineates the advantages of regional diversity in terms of exploitation and exploration, while also highlighting the expenses linked to being new and foreign, as well as the challenges of managing activities across borders. Prior study has failed to identify these factors together, nor has it examined the manner in which these advantages and disadvantages fluctuate over the phases of a company's internalization operations. While the expenses associated with novelty and foreignness diminish in the second phase, the subsequent category of expenses we illustrate, pertaining to coordination and governance, starts to increase. As a company's international subsidiaries network expands and its operations proliferate across various countries, governance and coordination expenses increase to a level where they may exceed the advantages of geographic diversification, resulting in a decline in firm performance, indicative of phase 3. We propose an S-shaped correlation that is horizontal between the degree of a company's performance and its FDI (foreign direct investment) (see **Fig 1**).

H1: The association between geographic diversity and performance of the business is non-linear, exhibiting a negative slop at a lower diversification level, a positive slope and negative slope at the middle, and high diversification levels, respectively.

Consequently, possessing international certification is a valuable asset for a firm, mitigating the liabilities of foreignness for SMEs by enhancing their legitimacy and facilitating entry into foreign markets, thereby assuring consumers of the quality of their products and services [14]. As newcomers, SMEs must establish their legitimacy and differentiate themselves to enhance competitiveness, thereby mitigating the perceived risks associated with their novelty and absence of a proven track

record, which often renders them less credible, trustworthy, and predictable. Certification fosters links with genuine participants in both domestic and local markets, enhancing their potential to capitalize on possibilities uncovered via connections with other organizations. Consequently, SMEs modify their domestic operating practices by integrating new procedures to capitalize on overseas market prospects. Our reasons suggest that company-specific resources are essential for all internationalizing firms, regardless of their initial internationalization degree. Consequently, we anticipate that company-specific resources will have a linear and positive moderating implication on the connection between performance and internationalization.

H2: A business's intangible resources modulate the link between geographic diversity and firm performance, such that elevated levels of intangible assets enhance the performance benefits derived from global diversification.

III. DATA AND METHODS

Sample and Data Collection

In order to assess the hypotheses, we analyzed data derived from a set of 2067 firms operating in different industries. The variables employed in the assessment are the measures of firm performance, geographical diversification and intangible assets. Our dependent variables are Tobin's Q and ROA (Return on Assets), two common measures of performance in the literature. Where ROA looks at operational efficiency, Tobin's Q will look at market efficiency. The key independent variable, geographical diversification, is illustrated as the extent of internationalization of the individual firm and we include linear, quadratic and cubic terms of the key independent variable to capture the hypothesized S-shape. Further, to test the second hypothesis, we added two control variables, Advertising intensity and R&D intensity as determinants of intangible resources that we expect to mitigate the implication of geographic diversification on business performance. Other control variables in the models used in the study are firm size (the natural total assets logarithm), leverage (debt to equity), the exchange rate and others. The exchange rate variable controls for currency differences; the impact of yen depreciation is also controlled by this variable. Pearson correlation coefficients and descriptive statistics for all the variables that were employed in the analysis are shown in **Table 1** below. The findings also show that geographic diversification is significantly related to both Tobin's Q and ROA at .051 level, but the strength of the relationship differs.

Table 1. Descriptive Statistics and Correlations

NO.	VARIABLES	MEAN	SD	1	2	3	4	5	6	7	8	9
1	ROA	0.03	0.04									
2	Tobin's Q	1.26	0.67	.10								
3	Rate of exchange	120.77	12.35	.014	.22							
4	Intensity of R&D	0.01	0.02	.07	.10	-.02						
5	Advertisement intensity	0.02	0.02	-0.1	-.15	-.03	.06					
6	Net salesb	11.06	1.43	.05	-.04	-.02	.12	-.03				
7	Produce diversification	0.57	0.18	-.03	-.02	.01	.11	.00	.18			
8	Debt-to-Equity ratio	3.26	0.75	-.18	-.01	.04	-.09	-.08	.04	.00		
9	Export intensity	0.10	0.15	-.00	.03	.00	.27	-.05	.15	-.02	-.03	
10	Internalization	0.04	0.07	-.06	.00	-.03	.21	-.06	.63	.15	.04	.34

[a] *The correlations are momentous at the .051 dimension (two-tail test) capped /.02/.* [b]*Logarithm.*

Variables

We measured firm performance using two dependent variables: The first was Return on Assets (ROA) which was used to establish the level of profitability that firms achieved by using their assets to generate returns. Tobin's Q, on the other hand, was employed in the study to effective asses business performance towards the market based on investors' anticipations established by market value ratio of totality of established assets to the cost of procuring similar assets. Both measurements enabled the consideration of firm performance from different angles, thus gaining a holistic view of the roles of internationalization on performance. The first antecedent in the study therefore concerned diversification which was measured as the proportion of international sales of the general sales. This variable referred to the level of internationalization that firms had achieved. To test the proposed nonlinear relationship, the cubic, squared, and linear terms of geographic diversification were also entered into the models separately. This enabled us to check for presence of an S-shaped link between geographic diversification and firm performance.

Based on these arguments, we proposed that intangible assets would mediate the link between firm performance and geographic diversification. In particular, we looked at the intensity of R&D efforts and market intensity as potential moderator variables. R&D intensity was as the total amount of R&D costs sub-divided by overall sales and advertising intensity was the total amount of expenditure on advertising divided by total sales. To examine the moderating impact of these two variable elements on business performance, the two variables were inserted into the models with interaction terms with geographic diversification. To minimize confounding of the results by other factors, we used other variables that affect

firms' performance as controls in the study; namely geographic diversification and intangible assets. First, we included firm size as the number of total assets in logarithm form because large firms generally have competitive advantages when entering international markets. We also incorporated the leverage determined by the overall debt to equity ratio; higher leverage is likely to add financial constraints on firms that seek to internationalize. In order to manage for the impact of business growth on international expansion, sales growth was introduced as another control variable. Also, we used exchange rate, especially for Japanese firms in our sample, in order to mitigate the impact of home country currency depreciation or appreciation. Finally, the industry effect was captured by the use of industry fixed effects in order to correct for random industry fluctuations in market volatility and global demand.

Analytical Approach

To effectively test the hypotheses, we employed Ordinary Least Squares (OLS) regression and each of the two dependent variables, that is, ROA and Tobin's Q, were tested separately. Our models were designed with an incremental increase in complexity. First, we estimate the baseline models (Models 1 and 7) which contained only the control variables. Then, we examined the curvilinear relationship between firm performance and geographic diversification by including the linear in Models 2 and 8, the quadratic in Models 3 and 9, and the cubic in Model 4 and 10 terms. Finally, to examine the mediating role of intangible assets, we added cross-product terms of geographic diversification with R&D intensity (Models 5 and 11) and with advertising intensity (Models 6 and 12). Wald tests were carried out to check the significance of the higher-order terms as well as the interaction effects We also check the joint significance of cubic, squared, and linear terms to confirm the nature of the relationship.

Robustness Checks and Software

To strengthen the confidence in results, additional tests were conducted in the study. First, we included higher lag levels of the independent variables up to 2 and 3 years in order to capture the possible lagged effect of geographic diversification on the performance of the firm. We also dealt with the possibility of simultaneous causality between a business' internationalization strategy and its effectiveness by employing a Two-Stage Least Squares (2SLS) regression analysis where geographic diversification and technological assets were treated as endogenous variables and appropriate instruments for dealing with bias were used. In addition, to check the difference in the relationship of FDI and performance between the internationally active and the domestic oriented firms, we conducted a subsample analysis, where we included only the firms with FDI activities and excluded the firms without. To control for multicollinearity, the independent variables were average based and VIF (Variance Inflation Factors) were computed to ensure that the problem of multicollinearity did not influence the current study. The coefficients were analyzed at the 95% level of confidence with a significance level of 0.05. All analyses were conducted utilizing Stata 15.0, and robust standard errors were utilized to control for potential heteroscedasticity. To enhance understanding, we reported coefficients of the key variables at a 95% confidence interval to provide statistical significance in the analysis.

IV. RESULTS

The findings are shown in **Table 2**. Return on Assets (ROA) serves as the dependent variables for the initial 6 Models (M), while Tobin's Q functions as the dependent variables for the subsequent 6 Models (M). M1 and M7 serve as the foundational models, including just the control variable quantity and 2 indicators of parent company resource advantages. The foreign rate has a mostly favorable impact, signifying that the depreciation of the national currency (yen) enhances the performance of Japanese companies.

Table 2. Results of the ROA and Tobin's Q

INDEPENDENT VARIABLES	**ROA**						**TOBIN'S Q**					
	M1	**M2**	**M3**	**M4**	**M5**	**M6**	**M7**	**M8**	**M9**	**M10**	**M11**	**M12**
INTERCEPT	-0.09**	-0.12**	-0.12**	-0.15**	-0.15**	-0.16**	-0.46**	-0.60**	-0.58**	-0.61**	-1.20*	-1.31*
	(-7.49)	(-7.87)	(-8.12)	(-9.27)	(-9.27)	(-9.85)	(-5.92)	(-7.47)	(-7.21)	(-7.37)	(-1.96)	(-2.30)
EXCHANGE RATE	0.03**	0.03**	0.03**	0.03**	0.03**	0.03**	0.03**	0.03**	0.03**	0.03**	0.02*	0.02

	(4.57)	(4.80)	(4.83)	(4.94)	(4.94)	(4.81)	(2.90)	(3.03)	(3.13)	(3.21)	(1.95)	(1.83)
R&D INTENSITY	0.06	0.06	0.06	0.06	0.06	0.06	0.07*	0.08**	0.08**	0.08**	0.07	0.06
	(0.81)	(0.86)	(0.84)	(0.85)	(0.85)	(0.88)	(1.80)	(1.99)	(1.86)	(2.00)	(1.52)	(1.31)
ADVERTISING INTENSITY				0.03**	0.03**	0.03**		0.03**	0.03**	0.03**		
				(4.41)	(4.43)	(4.49)		(4.52)	(4.55)	(4.61)		
SALES												
				(6.41)								
PRODUCT DIVERSITY (HERFINDAHL INDEX)	-0.13**	-0.13**	-0.13**	-0.12**	-0.12**	-0.12**	-0.14**	-0.13**	-0.13**	-0.13**	-0.13**	-0.12**
	(-5.16)	(-5.20)	(-5.12)	(-5.27)	(-5.27)	(-5.13)	(-4.53)	(-4.52)	(-4.53)	(-4.55)	(-4.55)	(-4.34)
DEBT-TO-EQUITY RATIO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.63)	(0.62)	(0.62)	(0.63)	(0.63)	(0.65)	(0.43)	(0.43)	(0.43)	(0.43)	(0.44)	(0.47)
EXPORT INTENSITY	-0.07	-0.07	-0.07	-0.06	-0.06	-0.06	-0.07	-0.06	-0.06	-0.06	-0.06	-0.05

	(-1.87)	(-1.85)	(-1.83)	(-1.83)	(-1.83)	(-1.82)	(-1.60)	(-1.60)	(-1.60)	(-1.60)	(-1.61)	(-1.44)
INTERNATIONALIZATION	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.01	-0.01
	(-0.65)	(-0.66)	(-0.65)	(-0.66)	(-0.66)	(-0.66)	(-0.45)	(-0.45)	(-0.46)	(-0.46)	(-0.41)	(-0.36)
INTERNATIONALIZATION SQUARED						0.01*		0.01	0.01			
						(1.94)		(1.35)	(1.44)			
INTERNATIONALIZATION CUBED						-0.01*		-0.01	-0.01			
						(-1.85)		(-1.55)	(-1.63)			
INTERNATIONALIZATION × R&D INTENSITY								0.86		0.84		
								(1.35)		(1.55)		
ADJUSTED R^2	0.10	0.10	0.10	0.11	0.11	0.11	0.11	0.11	0.12	0.12	0.12	0.12
WALD X^2	939.66**	1,065.91**	1,130.86**	1,132.50**	1,132.50**	1,133.02**	1,460.72**	1,642.77**	1,641.11**	1,646.79**	1,597.92**	1,705.70**
WALD TEST X^2 (1)	11.97**	4.11***	4.01***	3.21***	3.21***	3.13***	3.13***	21.15**	20.77**	5.09***	0.02**	7.41***

[a] Unstandardized regression coefficient is indicated, with the t-statistics integrated in the citation. [b] Logarithms. ** p < .010. * p < .051. * p < .10. The two-tail test.

The intensity of advertising and R&D had a substantial detrimental influence. All other controller factors had negative effects on business performance, with the exclusion of sales, which had a considerable positive implication on both ROA and Tobin's Q. This study evaluated Hypothesis 1 using M2(8), 3(9), and 4(10), constructing the examination of the S-shaped connection by including the linear internalization term in M2(8), its squared values in M3(9), and its cubic value in M4(10). This study used Wald tests to assess the relevance of including every new variable. Wald chi-square statistics indicate that the addition of the cubic factor enhanced models fit. The combined significance test of the cubic, squared, and linear components was substantial across all models.

Consequently, our H1 received robust support: firm performance exhibited a negative correlation with the linear term of internationalization, a positive correlation with the squared internationalization term, and a negative correlation with the cubic internalization term. H2 considers that intangible resources will have a positive, linear moderating effects on the link between business performance and internalization. M5(11) and M6(12) evaluated H2 by integrating internalization correlations with the intensity of R&D and internalization correlations with the intensity of advertising. The relationship between R&D intensity and internalization was statistically significant and positively correlated in M5, using ROA as a dependent variable. The relationship between advertising intensity and internationalization was both significant and positive in M12, using Tobin's Q as dependent variable. To validate these findings, our research employed Wald Test to ascertain that the integration of interactions factors considerably enhanced model fit. H2 received limited support. The primary impact of internationalization on performance remained significant across all models, even with the inclusion of interaction factors.

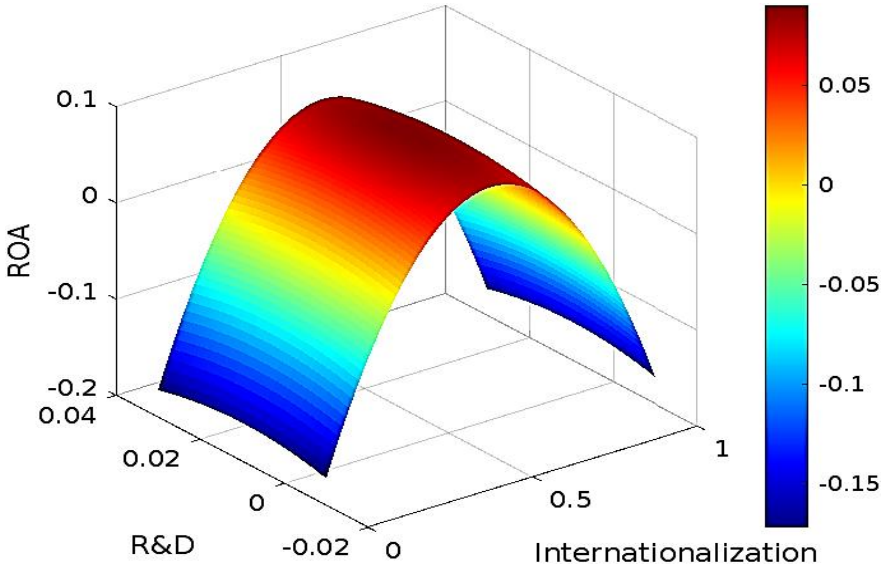

Fig 2. Controllers Influence of R&D Intensity on the Correlation between ROA and Internationalization

Utilizing the outcomes of M5 and M12, we created **Fig 2** and **Fig 3** to depict the nonlinear correlation between performance and regional diversity across enterprises with varying degrees of advertising and R&D intensity. **Fig 2** and **Fig 3** illustrate a connection that is originally negative, transitions to positive with increased geographical variety, and then becomes negative once again at elevated geographical diversity levels. In **Fig 3**, enterprises exhibiting two percent intensity of advertising have an adverse effect on performance at the first stage, resulting in a net decrease of around 0.351 in Tobin's Q when comparing the basic instance of minimal internationalization to internalization degree of 0.21. Further internationalization enhances performance, yielding a maximum increment of 0.501 in Tobin's Q (approximately a 40% rise from Tobin's Q value at a 0.2 degree of internationalization) and the overall increment of 0.151 in Tobin's Q (roughly a 12% rise from the figure at zero internationalization) whenever the internationalization level reaches 0.8. Exceeding this 0.8 threshold, an increased internationalization level correlates with poorer business performance.

A comparison of the disparities in R&D intensity and advertising intensity levels in **Fig 2** and **Fig 3**, respectively, demonstrates the positive and substantial moderating effect of firm-based resources. Consider **Fig 3** once again, for instance. A company with a degree of internationalization capped 0.31 and having a 4% intensity of advertising has an anticipated Tobin's Q that is 7% more than that of a company with the same level of internationalization but with an advertising intensity of 2%. At an internationalization level of 0.7, a 20% enhancement in Tobin's Q is anticipated when a firm's advertising intensity escalates from two percent to four percent. In this study, we performed many robustness assessments. We extended the lag to two and three years, yielding similar findings; however, the explained variance (R^2 value) diminishes as the lag lengthens. The findings are substantial within the subsample of 1,059 enterprises engaged in FDI operations.

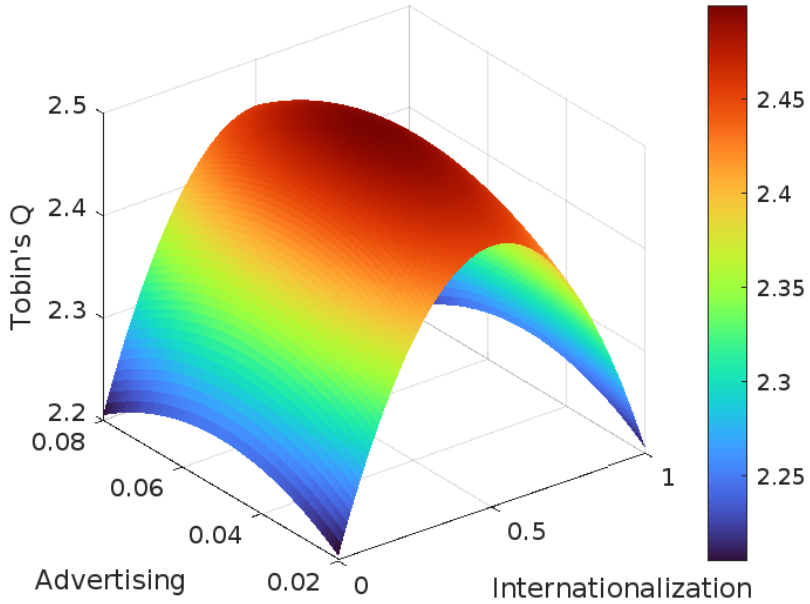

Fig 3. The Moderating Influence of the Intensity of Advertisement Concerning the Connection between Tobin's Q and Internationalization

The findings remain strong when employing ROA as dependent variable in 2,067 enterprises, independent of the availability of Tobin's Q value. Our variables were focused around their mean to reduce collinearity; and findings remained significant with the focused variables. The link we modeled is intricate, with both assets (e.g., technology assets) and strategy (e.g., internationalization) potentially being endogenous. To address the endogeneity problem, we employed a 2SLS (Two-Stage Least Squares) method, including internalization and technical resources as endogenous factors. S-shaped association remained strong with the 2SLS technique, although R&D intensity exhibited a positive correlation.

V. DISCUSSION

"Diversification across local boundaries into geographical regions, which are novel to the company" is a wide definition of internationalization. We purposefully chose this definition as various organizations may choose to take different approaches to internationalization, based on variables like industry and company size. While some businesses could prioritize internationalizing their company more than internationalizing their production, others might do the opposite. The globalization of R&D networks is a relatively new phenomenon. Previous empirical research suggests that, despite the general correlation between these measures of internationalization, R&D internationalization is less than that of sales.

By concentrating on how internationalization impacts the variables that dictate the financial benefit of innovation, one may get a knowledge of how it affects the returns on innovation. The conceptual framework may be simplified by classifying these components into two groups. The first is about the variables that affect a company's capacity for innovation; its ability to develop new technologies. High creative capability R&D departments can create better goods and processes more quickly and cheaply, which boosts a company's success. The second category encompasses the diverse range of elements that enable a company to: (1) more effectively use its technical advancements; and (2) safeguard and appropriate the benefits of innovation.

We analyzed the relationship between business performance and geographical diversity at several internationalization phases, across firms with differing resources. **Fig 2** and **Fig 3** illustrate that spatial diversification has a nonlinear connection with business performance. At both low and high internationalization levels, the degree of global variety was inversely related to business performance; conversely, at intermediate internationalization levels, increased regional diversity correlated with enhanced performance. The S-shaped correlation (horizontal) between regional diversity and business performance serves as a foundation for addressing the discrepancies in empirical findings within this field. At first glance, our findings seem to contradict the upright and inverted U-curves identified in other studies.

Our findings reconcile prior research by noting that the inverted U represents studies on well-internationalized firms [15], while the upright U pertains to newly internationalizing firms. We derived these conclusions by constructing a comprehensive theoretical model of advantages and costs experienced throughout the transition from fledgling to mature phases of international growth. We employed a twelve-year timeframe with different enterprises at various levels of internationalization. Based on this extensive theoretical framework and sample, one conclusion of our study is that scientists studying the link between business performance and geographic diversity might go beyond just assessing its nature to exploring its boundary moderators or conditions. We suggested that a business' intangible resources serve as a moderator. While not universally impactful across all the models, positive moderator influence of a business' expenditures in advertising and R&D assets demonstrates that intangible resources enhance the values derived from regional development.

Our examination of prior literature on internalization effects yielded ambiguous results about its influence on performance. Certain research validated the benefits of internationalization, whilst others refuted them. In research aimed at illustrating the beneficial effects of internationalization on firm performance, the non-linear and linear characteristics of the connection remained ambiguous. Some researchers, such as [16], have indeed indicated that internationalization does not impact performance. Initial interpretations of the impetus for worldwide expansion were based on the benefits derived from ownership, location, and internalization. Transaction cost theory provides a well-established justification for the pursuit of FDI, specifically regarding organizational expenses.

The resource-based approach enhances the theoretical framework of internationalization, positing that enterprises possessing distinctive, inimitable, and valuable resources are inclined to transfer these resources to global marketplaces to attain increased viability. Economies of scale and scope, a logical reorganization of operations, risk mitigation, and enhanced business learning elucidate the potential for increased profitability via integration. Alternative theoretical frameworks for international operations, like the network approach and the oligopolistic perspective, have been extensively disseminated. International growth, undoubtedly, incurs many expenses. Companies implementing a worldwide strategy encounter increasing expenses during the first phases of development, a phenomenon referred to as the "liability of foreignness" [17]. While this cost may decrease with more international expertise, transaction and coordination costs arise with elevated degrees of internationalization. The ambiguity linked to initiating international activities, including institutional deterrent, significantly elevates operational expenses. Ultimately, when the expansion of resource allocations and the internal competencies of multinational corporations fails to keep pace with the rate of internationalization, the expenses may surpass the advantages.

VI. CONCLUSION

The findings of this research are informative in depicting the non-linear and curvilinear link between geographic expansion and firm performance, mediated by intangible assets. These results indicate that both a low and high level of geographic diversification harms firm performance, but a moderate level of internationalization improves the performance based on ROA and Tobin's Q ratios. The moderating roles of advertising and R&D intensity are positive and significant to support that firms with more intangible resources are in a better position to exploit geographical diversification for competitive advantage. This research resolves earlier conflicting findings, and it is recommended that scholars and practitioners should also take into account the phase of internationalization and specific firm resources when drawing up strategies for internationalization. In summary, the findings also go beyond theoretical advancements, providing advice to firms that want to achieve the most efficient geographic dispersion in an integrated global economy.

CRediT Author Statement

The author reviewed the results and approved the final version of the manuscript.

Data Availability

No data was used to support this study.

Conflicts of Interests

The author(s) declare(s) that they have no conflicts of interest.

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There are no competing interests

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