THE AMBIDEXTROUS MICRO-ENTERPRISE: THE TRADEOFF BETWEEN EXPLORATION AND EXPLOITATION – EVIDENCE FROM TRINIDADIAN MICRO ENTERPRISES

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ABSTRACT

Micro-enterprises are often faced with a multitude of internal resource constraints. This research delves into the dynamic capability of an entrepreneur's ability to exploit the firm's current resource base and explore new opportunities, commonly referred to as Ambidexterity. The analysis considers the effect of exploration and exploitation on both performance dimensions of profit and growth. While larger firms may enjoy benefits from the maximization of both exploration and exploitation capabilities, we found that for micro enterprises, through a focus on maximization of one dimension, profits and growth performance is strongest when the second dimension is within a relatively average range relative to other firms in the sample. As such, we suggest that for small firms, there is a tradeoff that must be made between the two dimensions in order to yield maximum benefits from their interaction.

Keywords: *Ambidexterity, Exploration, Exploitation, Dynamic Capabilities, Micro-Enterprises, Entrepreneurship Performance*

INTRODUCTION

Micro, small and medium organizations (SMEs) are the backbone of economic activity throughout the Caribbean. Though official statistics are elusive, estimates of the GDP contribution of these firms to the region stands at 40 percent and accounts for more than 70 percent of total employment (Waithe, 2018). Even in oil and gas rich Caribbean nations such as Trinidad and Tobago, the Ministry of Labor and Small and Micro Enterprise Development statistics indicate that 91 percent of businesses locally are SMEs, with 75 percent consisting of micro-enterprises (Newsday, 2014).

Despite their prevalence, micro-enterprises are often faced with a multitude of internal resource constraints. With minimal environmental power, limited marketing, financial or human resource economies of scale, it is vital for micro-organizations to embed their most valuable resource in their core business strategy to ensure long term survival (Kelliher and Reinl, 2009). If organizations that control embedded resources are favoured to survive, then the entrepreneur's own characteristics can become a source of advantage (Zuraik and Kelly 2019). This research delves into the dynamic capabilities of the entrepreneur's ability to exploit the firm's current resource base and explore new opportunities, commonly referred to as the dynamic capability, Ambidexterity.

LITERATURE REVIEW

Dynamic Capabilities

Dynamic capabilities support the notion that the responsiveness and flexibility of a firm are crucial to the development of a sustainable competitive advantage. 'Dynamic', refers to the capacity to align new competences with the needs of evolving markets, while 'capabilities' emphasizes effective strategic management in matching the organizations existing relative advantages to the desires of the changing marketplace (Teece, Pisano and Shuen, 1997). Given the rapid rate of technological change, globalization and the intensification of global market rivalry, no firm can hope to sustain an advantage with entirely static resources and capabilities. Accordingly, dynamic capabilities are a multi-faceted construct, in that it emphasizes the firm's ability to sense opportunities and threats, and then to make timely market orientated decisions that change the nature and scope of the firm's resource base (Edwards, 2001)

Exploration and Exploitation Dynamic Capabilities

Two distinct dynamic capabilities that have emerged as intriguing areas of interest in the literature are exploratory and exploitative capabilities. March (1991) defines the exploration of a firm as "*experimentation with new alternatives having returns that are uncertain, distant and often negative*", while defining exploitation as "*the refinement and extension of existing competencies, technologies and paradigms exhibiting returns that are positive, proximate, and predictable*" (p. 85). These capabilities are seen as core to a firm's success through their ability to generate value en route to a competitive advantage, with some proposing that they are positively correlated, with both having the capacity to boost performance (She, Su and Cui, 2020).

The dynamic implications of these definitions are the continuous need for experimentation (exploratory) in the first instance and constant refinement (exploitative) in the second. The difference between the two is also clear; exploratory capabilities may emerge from the desire to discover something new, or as put forward by Levinthal and March (1993), "*the pursuit of knowledge, of things that might come to be known*", while exploitative capabilities are related to things that already exist or "*the use and development of things already known*" (p. 105).

Although different, exploitation and exploration capabilities are also closely related. Exploitation can eventually lead to the exhaustion of an advantage, which then causes firms to engage in exploration as they attempt to reveal new advantages which will be later exploited (Lee and Ryu, 2002). As discussed by March (1991) "*since long-run intelligence depends on* *sustaining a reasonable level of exploration, these tendencies to increase exploitation and reduce exploration make adaptive processes potentially self-destructive*" (p. 73). This suggests that exploitation in the absence of exploration may be short lived as eventually the exploitation can become ineffective. Conversely, firms excessively engaging "*in exploration to the exclusion of exploitation are likely to find that they suffer the costs of experimentation, without gaining many benefits*" (March, 1991, p. 71).

Further, exploitation can create the available financial resources to engage in exploration. It has been argued that engaging in exploration facilitates the development of technological assets and capabilities, which can then serve the exploitation process (Garcia, Calantone, and Levine, 2003). Yalcinkaya, Calantone and Griffith (2007) concur stating that "*exploitation forms the foundation on which exploration can exist*", (p. 71-72) and find empirical support for their claim of the significance of the relationship. Without the low-risk stream of income from the existing customer, costly exploration may not be possible.

Ambidexterity

Although Duncan (1976) is credited with being the first to use the term organizational ambidexterity, March's (1991) article is considered to be the stimulus for much of the interest in the field (Raisch and Birkinshaw, 2008). In his article, March (1991) proposes that exploration and exploitation represent two differing activities that firms devote their resources and attention towards. He links exploration to "*search, variation, experimentation, and discovery*" (p. 102), while suggesting that exploitation involves "*refinement, efficiency, selection, and implementation*" (p. 102), with the implication that each activity may require a unique strategy. Some research into firm ambidexterity investigates the tradeoff that may exist in aligning the firm to explore new competences or exploit existing ones (Ancona, Goodman, Lawrence and Tushman, 2001; Levinthal and March, 1993), with some authors suggesting that organizational practices that simultaneously attempt to achieve productive levels of exploration and exploitation were impossible (Wenke, Zapkau and Schwens, 2021, McGill, Slocum and Lei, 1992; Miller and Friesen, 1986).

However, while exploration and exploitation represent differing activities, successful firms may need to be aligned to productively do both. A firm has a one-sided focus on exploration may find it comes at the expense of the productive exploitation of their efforts. Conversely, by only focusing on exploitation, a firm may be unable to respond to changes in demand or fail to recognize product and process improvements that undercut its ability to effectively carry out exploitation activities. In their meta-analysis of organizational ambidexterity and performance, Junni, Sarala, Taras and Tarba (2013) find a significance between exploration activity and growth, but not profitability. Conversely, the authors report a significance between exploitation and profitability, but not growth. Given the performance tradeoffs that may exist with an over reliance on either exploration or exploitation by a firm, it may be advantageous to a firm to attempt to be adept at both exploration and exploitation, or in other words, ambidextrous.

In order to be an ambidextrous organization firms must be "*capable of operating simultaneously to both explore and exploit*" (He and Wong, 2004, p. 483), suggesting that through the pursuit of both exploration and exploitation, the shortcomings of a focus on only one aspect can be avoided. With regards to past research on this very possibility, Junni, Sarala, Taras and Tarba (2013) report that while significance between ambidexterity and growth has been found in past studies, the relationship between ambidexterity and profitability failed to show any significance, though the size of the firm was not considered in their analysis.

Beyond the general agreement that ambidexterity represents some form of relationship between exploration and exploitation, there is some confusion as to whether firm ambidexterity increases as a result of the combined magnitude of both exploration and exploration (a multiplication of the two measures) or if greater ambidexterity is achieved through the balance of exploration and exploitation, where closer exploration and exploitation levels would indicate a more ambidextrous firm.

With specific reference to micro enterprises, the ambidexterity relationship between exploration and exploitation may be heavily contingent on the slack resources available at the organizational level. Micro-enterprises, faced with severe resource constraints and little to no slack resources are unlikely to benefit from an extreme focus on both exploration and exploitation (highest combined magnitude) as this will result in an overburdening of their limited resources. Similarly, with a balanced approach of exploration and exploitation (equal levels of each) the micro firm may be unlikely to reap the maximum benefits of either in a crowded marketplace with a need for differentiation.

HYPOTHESIS

Helfat (1997) explains that dynamic capabilities are the competencies or capabilities that allow the firm to create new products, services or processes to meet changing market circumstances. Zahra, Sapienza and Davidsson (2006) add that firms that continuously create, define, discover and exploit entrepreneurial opportunities are able to leverage their dynamic capabilities, "*in the manner envisioned and deemed appropriate by its principal decision-maker(s)"* (p. 918). We will investigate the dynamic capabilities of exploration and exploitation, while proposing that organizational ambidexterity, or the ability to "*reconcile internal tensions and conflicting demands in their task environments*" (Raisch and Birkinshaw, 2008, p. 375) is significant in the explanation of performance (profits and growth) beyond the main effects of exploration and exploitation.

March (1991) proposes that exploitation and exploration represent two different activities, which can be viewed as two ends of a continuum. Exploitation and exploration both compete for organizational resources and as such, there may be trade-offs involved in a firm's ability to explore or exploit. In summarizing March's logic, Gupta, Smith and Shalley (2006) note that "*notwithstanding the adaptation benefits of both exploration and exploitation, the interplay between the two occurs in the form of a zero-sum game where exploration and exploitation compete for scarce resources, attention, and organizational routines*" (p. 695). The findings of Su, Cui, Samiee and Zou (2022) seem to support this notion, particularly in smaller businesses, finding that while exploration improved the performance of international SMEs, ambidexterity served to weaken their performance.

Given March's logic that the two are incompatible, it would be reasonable to assume that there may be benefit in the maximization of either exploration or exploitation. Indeed, some have proposed that the balance of exploration and exploitation is not a prerequisite for business growth (Jacobs and Cambre, 2020). However, sacrificing one for the other is not enough to explain a sustained competitive advantage. While a firm that attempts to maximize exploitation may experience some performance gains in the short run, doing so at the expense of exploration may result in an inability respond to changes in the environment (Ahuja and Lampert, 2001). On the other hand, a firm that does much exploration, but little exploitation may find themselves in a cycle of search and change that goes unrewarded (Volberda and Lewin, 2003). Critics of this approach argue that exploration and exploitation need to be re-combined to create value (Eisenhardt and Martin 2000), while the mere co-existence of the two capabilities in differing departments though important, is not enough to consider a firm ambidextrous (Gilbert, 2006).

Some research has acknowledged the importance of balancing the two seemingly contrasting activities, terming organizations that can do both as ambidextrous organizations. Ambidextrous organizations are "*able to implement both incremental (i.e., exploitative) and revolutionary (i.e., exploratory) changes*" (Tushman and O'Reilly, 1996, p.8), are "*capable of operating simultaneously to explore and exploit*" (Smith and Tushman, 2005, p. 524) and are "*capable of exploiting existing competencies as well as exploring new opportunities with equal dexterity*" (Lubatkin, Simsek, Ling and Veiga, 2006, p.2). Gupta, Smith and Shalley (2006) note that exploration and exploitation may occur in a complementary, rather than competing manner. Cao, Gedajlovic and Zhang (2009) argue that the two processes can be supportive of each other and assist in leveraging each other's effects noting that firms can "*become more capable of initiating various reconfigurations of existing knowledge and resources already under its control, capabilities associated with novel discoveries in products and markets*" (p. 784) and also suggest that that high levels of exploitative capabilities can better enable a firm to "*recognize and assimilate new external knowledge and resources*" (p. 784).

Zahra and George (2002) suggest that prominent exploitation capabilities are positively related to the development of new products and technologies, while exploration can also have positive effects on exploitation. Cao, Gedajlovic and Zhang (2009) cite the example of Apple Computer's iPod line as revitalizing the entire brand, showing how successful exploration can complement exploitation noting that "*successful exploration can also improve the economics of existing exploitative endeavors*" (p. 784).

Thus, it is hypothesized:

H1: Higher levels of exploitation capabilities are positively and significantly related to firm profitability

H2: Higher levels of exploration capabilities are positively and significantly related to firm growth

H3: Higher levels of ambidexterity (the interaction of exploitation and exploration capabilities) are positively and significantly related to firm profitability and growth

THE TRINIDADIAN MICRO FIRM CONTEXT

Being heavily reliant on the income from the sale of its oil and gas reserves, the 1980s was a time of hardship for Trinidad, born out of depressed commodity prices. Since this time, the government has incorporated micro-enterprise development as a strategy to alleviate poverty and boost employment (Karides, 2005). The Global Entrepreneurship Monitor National Report for Trinidad and Tobago, outlines that the government's entrepreneurial development framework consists of the provision of credit and other sources of finance, coordination of development agencies, training and human resource development, marketing opportunities and other support services for potential entrepreneurs (Murdock, Mc Donald, Joseph, Dardaine-Edwards, and Carrillo, 2010).

Considering that in 2012, the energy (primarily oil and gas) revenue accounted for $18.1 of the $47 Billion dollar GDP of the country (38.5%), SMEs with their 28% contribution to GDP represent the second largest contributor to GDP in the country. Of these SMEs, the largest contributor is the consumer-oriented sector consisting mainly of retail business at over 50% (Bailey, Pacheco, Carrillo, and David, 2012). Thus, while the integral importance of SMEs has been established, the GEM Trinidad and Tobago report (2012) also suggests that 70% of surveyed national experts agreed that the policies of the Trinidad and Tobago government generally do not favor new and growing firms. The vast majority of respondents also agreed that new and growing firms are faced with high levels of bureaucracy and regulatory requirements (88%) and heavy tax burdens (50%).

This paper will allow for the investigation of performance differences between firms by type of operation, location and their ability to engage in successful exploration, exploitation or both. Practical contributions from these findings could be the discovery of systematic success or failure or micro-organizations that either engage in a specific type of business, do so in a specific area. Further, the relative impact of exploration and exploitation on performance, or the existence of these capabilities within micro-organizations can be uncovered, informing local policy makers as to the status of these capabilities within the sample, and a better understanding of the wider population.

DATA AND METHODS

Research Sample

This study focuses on micro enterprises in Trinidad, being defined as those enterprises with 5 or fewer employees which is in line with Hendrickson (2009), who notes that in Trinidad, firm size is often classified based on the number of employees. During the four-month survey data collection period a total of 791 micro businesses, primarily selected based on geographical clustering, were approached to request their participation in the research. Of these businesses, 304 completed the survey completely, resulting a response rate of 38.4%.

Data for this research was collected through face-to-face meetings and in the overwhelming majority of the businesses that were visited and asked to participate, the researcher showed up to the place of business unannounced. As a result, of the 791 businesses that were visited, the entrepreneur of the micro business was not on site in 355 of those businesses (44.9%). Some micro entrepreneurs (n=132) who were available at the time of the researcher's visit declined to participate. This means that of the businesses with the entrepreneur present, in 304 of 436 cases, representing 69.7%, a completed survey was obtained, while in 30.3% cases it was not. Many of the entrepreneurs who declined did so without giving a reason, however of those who did offer an explanation for refusal to participate reasons included: too busy at time of visit, too tired, too personal, not applicable to type of business and did not speak English well enough. Of the reasons given for unwillingness to participate, the entrepreneur being too busy was the primary reason.

Table 1
Response Rates

Total Businesses Visited	791
Completed Surveys	304 (38.4%)
Non-respondents	487 (61.6%)
Non-respondents – Entrepreneur not present	355 (44.9%)
Non-respondents – Other (too busy, too tired, too personal, not relevant, language barrier)	132 (16.7%)

Measures of Exploitation, Exploration and Ambidexterity

Measures of exploitation, exploration and ambidexterity have varied throughout the literature. Yalcinkaya, Calantone and Griffith (2007) used 4 items (2 each for exploration and exploitation), while Jansen, Bosch and Volberda's (2006) measure included 7 items each for exploration and exploitation. In the interest of parsimony and consistency, we primarily draw from by Mom, Van Den Bosch and Volberda, (2007) and Abebe and Angriawan, (2014) three item measures each for exploration and exploitation and operationalize the items at the firm level. All items are measured on a seven-point scale from 1= to a small extent to 7= to a very large extent.

Once data was collected on a firm's exploration and exploitation activity, it was important to consider the operationalization of the ambidexterity construct. Cao, Gedajlovic and Zhang (2009) suggest a lack of consensus on the underlying construct has led to numerous measures attempting to operationalize ambidexterity, through their review of the literature the authors suggest that ambidexterity is actually comprised of two related, but distinct measures that they term "balance dimension of ambidexterity" (BD) and "combined dimension of ambidexterity" (CD). In the first instance, the balance dimension of ambidexterity is a measure of the difference between exploration and exploitation, with relatively smaller differences meaning higher levels of ambidexterity. On the other hand, the combined dimension is a measure of the combined magnitude of exploration and exploitation (multiplication). An example of the differing conceptualizations is shown below in Table 2.

Table 2
Illustration of Different Conceptualizations of Organizational Ambidexterity

Firm	Exploration	Exploitation	Balanced Dimension (BD)	Combined Dimension (CD)
Firm A	7	3	Low	High
Firm B	3	3	High	Low

As shown above, as a result of the differing dimensions, the interpretation may be ambiguous. If ambidexterity were thought of as the balance between exploration and exploitation, Firm B would appear more ambidextrous, while if conceptualized as the combined magnitude, Firm A is more ambidextrous. Cao, Gedajlovic and Zhang (2009) propose that "*high CD will exert a more positive effect on firm performance when the firm also maintains a high level of BD*" (p. 784), suggesting a synergistic effect on performance.

For instance, a firm that responds to the exploration survey items with scores of 7, 5 and 6, has an exploration score of 6 ((7+5+6)/3). If the same firm's exploitation item responses are 5, 2 and 2, its exploitation is 3 ((5+2+2)/3). To calculate the CD of ambidexterity for this firm, the exploration and exploitation measures would be multiplied (6*3) equaling 18. To calculate the BD we find the absolute difference between exploration and exploitation (|6-3|) equaling 3. To help with the interpretation of the BD, absolute BD is subtracted from the maximum BD, in this case 7, meaning that the higher the number the higher the BD ambidexterity measure. For instance, if the BD for a firm is 0 (equal exploration and exploitation), subtracting this from 7, would yield a BD score of 7/7, or the highest BD possible. Finally, to calculate ambidexterity based on both dimensions, CD is multiplied by the BD, which in the above example would yield an ambidexterity of 72 (4*18), which we term total ambidexterity.

However, in our analysis, in an attempt to capture the effects of resource shortages in micro-organizations we kept the CD measure as described above, but reformulated the balance dimension (BD) such that the new balance dimension = 1 + |exploration – exploitation|. We reasoned that given the demands faced by entrepreneurs in micro-organizations, the maximization of both exploration and exploitation activities are unsustainable and thus, micro-organizations are better off though a dedicated attempt to maximize either exploration or exploitation at any given time.

As an example, consider two firms with exploration and exploitation scores of 4 and 7 for company A, and 6 and 7 for company B. Company A would have a calculated CD score of 28 (4*7), while firm B would have a CD score of 42 (6*7). Under the legacy BD dimension, company A would score 4 (7-(|4-7|) and company B would score 6 (7-(|6-7|), resulting in an ambidexterity measure of 112 for company A (28*4) and 252 (42*6) for firm B. However, as reasoned above, micro-organization who face immense recourse constraints are unlikely to sustainably manage high levels of both exploration an exploitation. As such, the proposed ambidexterity measure considers this unsustainability such that under the new calculation of BD, company A would score 4 (1+(|4-7|), while company B would score 2 (1+(|6-7|). The resulting ambidexterity score would be 112 (28*4) for company A, while company B would now score 84 (42*2). The legacy formula and new ambidexterity formula are shown below:

*Legacy Ambidexterity = Exploitation * Exploration (Combined Dimension) * (7 - |exploitation – exploitation|) (Balanced Dimension)*

*New Ambidexterity = Exploitation * Exploration (Combined Dimension) * (1 + |exploitation – exploitation|) (Balanced Dimension)*

To better understand the impact of the change Table 3 shows various sample exploration and exploitation scores and the resulting legacy and new total ambidexterity scores. From the table below, the difference in the two calculations is apparent. With regards to the legacy ambidexterity calculation, the higher the exploration and exploitation score (and closer together) the higher the ambidexterity. The new ambidexterity score also rewards higher exploration and exploitation scores, however, only does so to a point. In essence, the new ambidexterity tends towards rewarding a disparity between exploration and exploitation. This new calculation suggests that to maximize the ambidexterity, it may be in the interest of micro entrepreneurs to maximize one dimension (either exploration or exploitation) while just being average at the other dimension (neither attempting to maximize, nor ignoring). Further testing between the legacy and new calculations are shown in Appendix 1 demonstrating an improvement in model fit with the new ambidexterity calculation when compared to the legacy calculation.

Table 3 Legacy versus New Ambidexterity Calculation Scores for SMEs						
Exploration Score	**Exploitation Score**	**Legacy Balance Dimension (BD)**	**New Balance Dimension (BD*)**	**Combined Dimension (CD)**	**Legacy Ambi-dexterity (A)**	**New Ambi-dexterity (A*)**
1	1	7	1	1	7	1
2	2	7	1	4	28	4
3	3	7	1	9	63	9
4	4	7	1	16	112	16
5	5	7	1	25	175	25
6	6	7	1	36	252	36
7	7	7	1	47	343	49
1	7	1	7	7	7	49
2	7	2	6	14	28	84
3	7	3	5	21	63	105
4	7	4	4	28	112	112
5	7	5	3	35	175	105
6	7	6	2	42	252	84

CONTROL VARIABLES – SIZE, AGE, LOCATION, INDUSTRY, ACCESS TO FINANCIAL RESOURCES, GROWTH INTENTIONS

The use of control variables was introduced as they help to simplify complex social situations. By controlling certain variables, we rule out variables that may not be of immediate interest, but that may explain some aspects of the phenomenon under investigation (Singleton and Straits, 2010).

To control for the effects of size, we used the number of employees as a proxy for the size of the firm. Respondents were asked the number of full-time employees including working owners and also part-time workers. To control for industry, we asked respondents if their primary line of business was in manufacturing, service or retailing. A third control variable employed was the age of the firm, measured by asking respondents, the commencement year of the business and subtracting from the current year. The fourth control variable is that of firm location. Firms from various cities and towns throughout Trinidad are categorized as belonging to the West, Central, East and South region. These regions correspond to the four primary centers of business activity and population density and encompass the entire country.

Another control used was a firm's access to finance. Given the possible linkages that may exist between a firm's access to financial resources and its performance and to ensure that the relationships discovered between the variables on interest exclude the possible confounding effect of differing access to finance. A final control variable used was the growth intentions of the firm. In some instances of micro entrepreneurship, the entrepreneur has little intention to grow the business beyond a level that provides for the sustainability of the business. To account for this possibility respondent were asked their growth intentions for the business.

MEASURES OF PERFORMANCE – PROFIT AND GROWTH

At times, entrepreneurial activity may lead to favorable results on one performance dimension, but an unfavorable result on another. Consider a firm that has reduced its prices significantly in a bid to increase its sales. While the firm may report high levels of growth (driven by the price cutting strategy), it may also be likely that the firm's profitability will suffer as a result of the move to drop prices, as the newer lower price will mean lower or even negative net profit margins. Thus, research that only considers a single performance dimension may be misleading in the implications it draws from its findings. The performance dimensions of profits and growth capture the relative implied positive effects of exploitation and exploration respectively, such that effective exploitation should result in high levels of profits, while effective exploration should result in the growth of the firm. As such, the analysis considers the effect of exploration, exploitation and ambidexterity on both measures of profitability and growth.

RESULTS

Scale Validation

Table 4 below identifies the minimum (exploration = 1, exploitation = 1.33), maximum (exploration = 7, exploitation = 7) means (exploration = 5.2727, exploitation = 5.9091) and standard deviation (exploration = 1.56, exploitation = 1.00) of exploration and exploitation. It should be noted that based on an outlier analysis, 7 of the initial 304 respondents were dropped from the results.

Table 4
Exploration and Exploitation - Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Exploration	297	1.00	7.00	5.2727	1.56277
Exploitation	297	1.33	7.00	5.9091	1.00055

Tests of normality were also conducted and showed that both variables met acceptable criteria (Kline, 2011) with regards to skewedness (exploration = -.829, exploitation = -1.419) and kurtosis (exploration -.068, exploitation = 3.134). As a test of internal consistency, a Cronbach Alpha calculation was preformed, and the results are shown below in tables 5 and 6.

Table 5
Reliability Statistics

	Cronbach's Alpha	N of Items
Exploration	.796	3
Exploitation	.573	3

Table 6
Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Exploration Capability Q1	11.03	9.529	.679	.682
Exploration Capability Q2	10.40	10.659	.679	.681
Exploitation Capability Q1	11.89	4.873	.381	.472
Exploitation Capability Q2	11.64	5.063	.413	.430
Exploitation Capability Q3	11.93	4.643	.357	.516

As seen from the above tables, the exploration construct shows strong internal consistency with a Cronbach Alpha calculation of .796. For the exploration construct, it can be seen in Table 6 that should any item measure be deleted, the overall Alpha score would fall suggesting that all items align appropriately. Exploitation also shows some level of consistency. The Cronbach Alpha score for exploitation is .573, which admittedly is towards the lower end of what can be considered acceptable (George and Mallery, 2003), with a score of above .7 being conventionally preferred (Nunnally, 1978). However, as seen from Table 6 if any of the items were removed from the scale, the overall Alpha score would fall. To further assess the exploration and exploitation constructs, a factor analysis was performed using the six item measures that made up the two scales (three each). The results from this factor analysis are shown below in Table 7.

Table 7
Exploration and Exploitation Pattern Matrix

	Component	
	1	2
Exploration Capability Q1	**.918**	-.087
Exploration Capability Q2	**.901**	-.048
Exploration Capability Q3	**.608**	.292
Exploitation Capability Q1	.220	**.583**
Exploitation Capability Q2	-.200	**.928**
Exploitation Capability Q3	.114	**.591**

Extraction Method: Principal Component Analysis.
Rotation Method: Promax with Kaiser Normalization.

Based on the results from the factor analysis both exploration and exploitation appear to be separate constructs. The three item measures for exploration load onto one factor (average loading = .809) and the three item measures for exploitation also load onto one factor (average loading = .701), suggesting the items all tap a single, underlying factor.

Hypothesis Testing

Tables 8 and 9 below reveal the results from the multiple regression analysis. In both instances of testing profitability (Table 8) and growth (Table 9) the first model (Model 1) shows the results from the testing control variables in isolation. Model 2 introduces the dimensions of exploitation and exploration, while Model 3 further introduces the calculated new ambidexterity dimension as discussed previously.

Table 8 Dependent Variable: Profitability			
	Model 1	**Model 2**	**Model 3**
(Constant)	4.149***	4.244***	4.142***
Number of Years in Operation	-0.007	-0.002	-0.002
Full Time Employees	0.005	-0.062	-0.05
Part Time Employees	0.101**	0.087**	0.088**
Access to Finance	0.171***	0.164***	0.166***
Location	0.077	0.104*	0.115*
Type of Business Activity	-0.069	-0.129	-0.115
Growth Intentions	-0.118***	-0.087**	-0.08**
Exploration		0.06	0.083
Exploitation		0.404***	0.212**
New Ambidexterity			0.013***
F	7.607***	11.002***	11.407***
R squared	0.156	0.257	0.285

*** p<.001, **p<.05, *p<.1

Table 9
Dependent Variable: Growth

	Model 1	Model 2	Model 3
(Constant)	4.49***	4.528***	4.458**
Number of Years in Operation	-0.015**	-0.008	-0.008
Full Time Employees	0.107*	0.04	0.048
Part Time Employees	0.104**	0.091**	0.091**
Access to Finance	0.152***	0.141***	0.143***
Location	-0.039	-0.005	0.003
Type of Business Activity	-0.047	-0.098	-0.088
Growth Intentions	-0.146***	-0.108**	-0.103**
Exploration		0.13**	0.147**
Exploitation		0.306***	0.173
New Ambidexterity			0.009**
F	8.819***	10.869***	10.360***
R squared	0.176	0.254	0.266

*** p<.001, **p<.05, *p<.1

The results above provide support for H1, H2 and H3. Model 2 in Table 8, using profitability as the dependent variable, shows that exploitation capability shares a positive and significant relationship with profit performance (H1, p<.001), while exploration does not. When using growth as the dependent variable, Model 2 in Table 9, shows that exploitation shares a significant and positive relationship with growth (H2, p<.001). Adding ambidexterity, with dependent variable profit, (Table 8, Model 3) serves to improve the R squared and F-Statistics, while also having an unstandardized coefficient that is positive and significant, in line with the predictions of H3. Similarly, with growth as the dependent (Table 9), ambidexterity is positively and significantly related to growth performance confirmed the prediction made in H3, while also improving the R squared as compared to Model 1 and 2.

DISCUSSION

We found ambidexterity to be positively and significantly related to the performance dimensions of profit and growth, beyond the effects of exploration and exploitation. In the model with just control variables, the exploration and exploitation dimensions (and profit as the dependent variable) demonstrated an R squared of .257, of which the addition of the ambidexterity calculation improved the model's R squared to .285. The F statistic also improved with the addition of the ambidexterity calculation from 11.002 to 11.407. With growth as the dependent the R squared improved with the addition of ambidexterity from .254 to .266.

While in larger organizations ambidexterity can be achieved through specialist departments that focus on one aspect of the task (exploration or exploitation), in smaller organizations, there tends to be a resource shortage. Often, micro enterprises are born out of necessity and begin operations with extremely limited resources. This lack of resources translates into an inability to effectively execute a maximized dual exploration and exploitation strategy. In fact, even once established and operating, micro-organizations are faced with challenges that result in the need for sacrifice.

Consider the challenge of Trinidadian micro enterprises affording a credit card terminal charge and commission fees associated with the machines. A 'Linx' terminal (as locally branded) can carry fixed rental costs of between TTD $300 – $450 per month, as well as commissions on credit card sales that can run as high as 5% for smaller business. In addition to being able to absorb the fixed rental charges on these Linx machines more easily than their smaller counterparts due to their volumes, larger business, deemed more 'secure' by the local banking sector, are offered commission rates as low as 1.5% on credit card transactions. As such, beyond the resource shortages that exist internally, micro businesses are faced with systemic challenges that force tradeoffs between exploration/growth (getting the new Linx machine) and exploitation/profitability (Rental charges, commission fees).

At present, a fixed exchange rate regime in Trinidad has resulted in a shortage of foreign exchange and thus, the inability of smaller businesses without established banking relationships to legally access foreign exchange at the official exchange rate. While a black market for foreign exchange does exist, micro-organizations often are forced to pay a 20 – 40% premium on black market forex purchases. This scenario reenforces the tradeoff between exploration and exploitation faced by local micro-organizations, with those who may seek growth through the introduction of new products or technologies sourced from abroad being forced to do so at immediate risk to their profitability. Similarly, Trinidad has been facing a surge in crime with businesses being forced to deal with the implications of the provision of effective security controls. At low level of sales employing private security to stem external or internal theft is unaffordable. In order to ensure that all sales and stock are accounted for properly, micro entrepreneurs are forced to sacrifice exploration activity that may require leaving the physical store, in order to remind on site to police the operations.

Based on the results, it seems that micro-organizations that attempt to maximize their exploration and exploitation activities have difficulty transforming both their exploration and exploitation capabilities into above average performance. In other words, these organizations run the risk of 'spreading themselves too thin' if they attempt to maximize both dimensions of ambidexterity. A business that has only one, or a couple employees will find it incredibly difficult to maximize their exploration activities while also maintaining very high levels of exploitation. As a result of this discovery, ambidexterity that tends towards scoring the highest level of ambidexterity when either exploration or exploitation is maximized and there exists a small gap between the two dimensions has been found to be more effective in the explanation of growth and performance of micro enterprises.

Micro firms seem to benefit most from attempting to maximize one dimension of ambidexterity, while attempting to be at least relatively average in the other dimension. For instance, a firm that has a very high exploration score is likely devoting a lot of its time to the search for new opportunities and acquiring new skills. Our findings indicate that this firm must also devote a moderate amount of time towards refining the businesses' current procedures and improving the efficiency of operations. Failure to at least be relatively average on one dimension creates an overt imbalance that appears to negatively influence the performance of the organization. Continuing the example above, maximizing exploration at the complete expense of exploitation is likely to be unsustainable given the costs of exploration, while maximizing both exploration and exploitation is deemed unsustainable given the resource shortage that micro-organizations face. Thus, some degree of trade off must be made between exploration and exploitation in micro-organizations in order to appropriately benefit from the specific capability.

LIMITATIONS

It is prudent to acknowledge the limitations of the study that was conducted. One such limitation is the selection of the sample population. Ideally, we would have utilized a survey of legally registered business, however, attempts to secure such a listing from governmental agencies were unsuccessful. It is estimated that 80% of the surveyed micro-organizations were formally registered, with the remaining 20% operating without registration. In addition, survey participants were approached during regular business hours. This meant that business owners that were especially busy when asked to complete the survey were often unable to do so, which could have possibly introduced bias into the data given that businesses that may have been especially successful were unable to participate. Finally, measures of profitability and growth were self-reported, which may have led to instances where the relative scales used to access performance may not have been equal.

CONCLUSION

The guiding research question in this paper considered the impact of exploration and exploitation capabilities and their interaction, termed ambidexterity. We found evidence that supported the efficacy of the ambidexterity concept beyond that of the main effects of exploration and exploitation capability. Initially, we reasoned that increasing amounts of exploration and exploitation led to a greater ambidexterity score and in turn greater performance, however, the data revealed a more nuanced relationship. That is, while it does appear that very high levels of either exploration or exploitation are positively and significantly related to growth and profit performance respectively, the ambidexterity relationship is more strongly related to performance when the one of the dimensions is not maximized, but rather, average.

Following from this finding, we suggest that there is a tradeoff that must be made between exploration and exploitation in order to yield maximum benefits from their interaction. The scarcity of resources faced by micro-organizations suggests that attempting to maximize both exploration and exploitation leads to a scenario in which neither in actuality can be absolutely advantageous. Future research on the nuances of the calculation of ambidexterity can serve as an exciting area of study. While our findings suggested that micro-organizations that often face severe resource constraints can benefit from a slight imbalance in their scores of exploration and exploitation, more can be done to understand the expected outcomes. For instance, while significance in relation to growth and profitability was discovered with a maximization of either exploration or exploitation and a moderate level of the other, questions remain as to whether there is any significance as to which of the two dimensions should be maximized. Further, research that investigates the impact, if any, of a slight imbalance in levels of exploration and exploitation in larger firms would serve as an insightful comparison to the findings of this study.

By choosing to focus on either exploration or exploitation micro enterprises appear to more effectively maximize the performance returns that may result from the specialization. This is not to say micro-organizations should ignore the secondary dimension. We found that while focusing on maximization of one dimension, profit and growth performance is strongest when the second dimension is within a relatively average range relative to other firms in the sample. For instance, firms that choose to focus on exploration and the search for new ideas cannot ignore the elements of exploitation; the search for new ideas cannot finance itself. Past exploration must be monetized and exploited so that the funds are available to continue exploration. Similarly, the firm that only focuses on exploitation will eventually encounter a scenario where competitive forces have eroded any advantage that may have existed. In the absence of new ideas generated from exploration activity, productive exploitation will cease.

Therefore, it is likely that the tradeoff between maximization of exploration or exploitation is temporal such that at different stages of the business life cycle a focus on one aspect of exploration or exploitation can yield differing impacts unto performance. For instance, new firms may find it worthwhile to commence operations with a focus towards exploration. Once productive benefits are yielded from the exploration process (e.g. new ideas) a switch in focus to exploitation may be beneficial to maximize possible returns.

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Appendix 1
Tests of Legacy versus New Ambidexterity Calculation

Test of Legacy versus New Ambidexterity - Dependent Variable = Profits

	B- unstandardized coefficient	**Model R squared**	**F-Statistic (significance refers to change)**
Legacy Ambidexterity	.003**	.189	8.396**
New Ambidexterity	.020***	.255	12.295***

*** p<.001, **p<.05, *p<.1

Test of Legacy versus New Ambidexterity - Dependent Variable = Growth

	B- unstandardized coefficient	**Model R squared**	**F-Statistic (significance refers to change)**
Legacy Ambidexterity	.004***	.218	10.032***
New Ambidexterity	.015***	.228	10.610***

*** p<.001, **p<.05, *p<.1

Appendix 2
Survey Items

Exploration

1: My business spends a great deal of time searching for new business opportunities:
To a very small extent 1 2 3 4 5 6 7 To a very large extent

2: My business spends a great deal of time considering the options with respect to new way to make profits:
To a very small extent 1 2 3 4 5 6 7 To a very large extent

3: Learning new skills and being adaptable is important to my business:
To a very small extent 1 2 3 4 5 6 7 To a very large extent

Exploitation

1. My business always emphasizes the same products and services because our customers enjoy the current offering:
To a very small extent 1 2 3 4 5 6 7 To a very large extent

2. Operating my business involves the using the knowledge I already have:
To a very small extent 1 2 3 4 5 6 7 To a very large extent
3: Reducing expenses and improving efficiency are important preoccupations to my business:
To a very small extent 1 2 3 4 5 6 7 To a very large extent

Performance

1: Over the past three years, in comparison to my competitors my business profits are:
Well below normal 1 2 3 4 5 6 7 Well above normal

2: Over the past three years, the business' growth in sales has been:
Very weak 1 2 3 4 5 6 7 Very strong

Controls

1. How many years has your business been in continuous operation? _______

2. How many full-time employees does your business have? _________

3. How many part time employees does your business have? __________
4.With 1 representing not true at all and 7 representing very true, how true is the following statement: "If there was a need for business financing, my business would be able to secure any amount it needed":
Not true at all 1 2 3 4 5 6 7 Very true

5. Firm location? ________

6. Primary product/service/industry? _________

7. With 1 representing not true at all and 7 representing very true, how true is the following statement: "I have no plans to significantly expand the size of my business":
Not true at all 1 2 3 4 5 6 7 Very true