

SME Identity and Homogeneity – Are There Meaningful Differences Between Micro, Small, and Medium-Sized Enterprises?

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This study examines entrepreneurial orientation, learning orientation, information technology competency, firm profitability and growth, with respect to differences exhibited among three size categories—micro, small and medium—within the SME classification. The results of our examination reveal significant differences among the three categories on some of the dimensions but no differences on others. Further, the pattern of similarities and differences may lead to useful suggestions for SME managers. The implications with respect to practice and further research are discussed.

INTRODUCTION

There is a growing body of literature that addresses many distinctions between large business firms and small- and medium-sized enterprises (SMEs are generally defined as those firms with fewer than 500 employees in the US and fewer than 250 employees in the European Union). Researchers have examined small versus large firms in terms of their flexibility and innovativeness (Salavou, Baltas & Lioukas, 2004); resource constraints; and the liability of smallness (Aldrich & Auster, 1986). The results of research to date provide important insights with respect to differences that characterize small- and medium-sized enterprises (SMEs). While the effort to draw distinctions between small and large firms is informative and useful, a drawback to examining SMEs as a class of firms is that they may be viewed as a population of enterprises with relatively homogeneous characteristics.

The statistics regarding small and medium-sized enterprises (SMEs) are well known—the number of SMEs dwarfs by an extremely large percentage the number of large firms in developed and developing economies. During the last two decades researchers have increasingly recognized that, for very pragmatic reasons, much of what is understood about business enterprise has been derived from the study of large business. Therefore we can conclude that from our academic research effort we know a great deal about a very small percentage of the population of firms and relatively little about the very large population of SMEs. Following from this circumstance there have been an increasing number of researchers taking up the challenge to gain insights and understanding about the very large majority of firms we term SMEs.

An over-arching issue with the study of the population of SMEs is the arguably insidious assumption of homogeneity within the category. While there are exceptions, much SME research has either contrasted SMEs (as a group) to large firms with respect to meaningful constructs or has applied constructs developed and tested on samples of large firms to SMEs (as a group). For example Aldrich and Auster (1986) highlighted resource constraints and the liability of smallness as key differences between large firms and SMEs; Salavou, Baltas and Lioukas (2004) contrasted larger firms with small firms on the dimensions of flexibility and innovativeness; and Pett, Wolff, and Perry (2010) applied the information technology competency (ITC) construct (Tippins & Sohi 2003) to a sample of SMEs. The effort by these researchers is not without value but it may not provide a full and accurate representation that a finer-grained within-group examination might reveal.

Firm size measured by the number of employees is a key dimension for SME researchers (cf. Beck, Demirgüç-Kunt, & Maksimovic 2006). Though it is not an ideal measure (a topic beyond the scope of this paper), the number of employees is a measure that is viewed as relatively benign by SME managers and owners. Since the vast majority of SMEs are privately held firms, disclosure for research purposes of financial measures of size (such as sales volume, book value, or other such performance measures) is simply not a likely option. Hence researchers are left with measures that SME managers and owners may be willing to provide.

SMEs as a group may certainly be invariant on certain dimensions. However, they may also vary greatly within the group on other dimensions. Perhaps the differences are greater between very small firms and medium-sized firms than are the differences between medium and large firms. These are empirical questions that, for the most part, have yet to be examined in the research literature. The research question driving our study is “Are there significant differences among very small (micro) firms, small firms, and medium-sized firms on important SME research dimensions and do those differences translate to performance variation?” We have chosen to examine entrepreneurial orientation (EO), learning orientation (LO), and information technology competency (ITC) in this study because each has received significant attention in the SME research area. EO has become a major construct in the corporate entrepreneurship and SME research literature. Miller’s (1983) conceptualization of EO—risk taking, innovativeness, and proactiveness—and Covin and Slevin’s (1989) operationalization has yielded a substantial literature taking shape around the construct (for example, Covin & Slevin, 1991; Covin, Green & Slevin, 2006; Lumpkin and Dess, 1996; Richard, Barnett, Dwyer & Chadwick, 2004; Wiklund & Shepard, 2003; Wolff & Pett, 2007).

Organization learning has been gaining the attention of entrepreneurship researchers recently (focused issue of *Entrepreneurship Theory and Practice*, July 2005). A number of papers in the issue propose that learning is an essential element in the opportunity recognition process (for example, Dutta & Crossan, 2005; Lumpkin & Lichtenstein, 2005) preceding firm origination. In addition Acs and Audretsch (2003) argue that learning is a critical issue during the growth phase after firm founding. Learning orientation as a construct has been effectively operationalized (Sinkula, Baker & Noordewier, 1997) and may be argued to be essential as an antecedent to innovation, opportunity recognition, or both resulting in higher levels of firm growth (Wolff & Pett, 2007).

A third construct that has received attention in the strategic management literature but has yet to receive significant study in the context of small firms is information technology competency (ITC) (for example, Tippins and Sohi, 2003). Historically, information technology capabilities may have been limited to the domain of large firms primarily due to the cost of computer systems, software and the need for specialized individuals with the training and skills. However, with the technological advance of computing power, the consistent decline in the cost of computing power, and the increase in usability by those without high levels of training, smaller firms may be disadvantaged by not attaining a significant level of IT competency.

Therefore, the purpose of this paper is to explore the differences that might exist between different size categories within the SME classification to answer the research questions posed above. To that end, in the first section of the paper we develop the logical and theoretical underpinnings along with specific hypotheses to be tested. In the second section we provide the methodology employed in gathering data to

test the hypotheses and then we present the analysis and results of the statistical examination. We conclude the paper with a discussion and interpretation of the results and provide our assessment of the implications for practice.

Theoretical Background and Hypotheses

Miller's (1983) seminal work on entrepreneurial orientation (EO) proposed that certain firm-level behaviors—risk taking, innovative, and proactive behavior—captured the essence of entrepreneurship characteristics in the firm. Extending Miller's work other researchers have proposed that EO behaviors are likely to yield higher levels of performance (for example Covin and Slevin, 1991). The expectation for a positive link between EO and performance derives primarily from the recognition that globalization, technological change, shortened product life-cycles and competitive dynamics have driven firms to be more creative and entrepreneurial in their approach to markets (Ireland and Hitt, 1999).

To the extent that an EO allows SME firms to be more efficient in their activities, cater to customer needs in superior ways, or be faster to market than competitors, firms may be able to create competitive advantage and hence superior performance (Covin, Green and Slevin, 2006). However, EO may be tempered by firm size. While one normally thinks of very small firms as entrepreneurial, the dimensions of EO are likely to be influenced by the resources available to be innovative, risk-taking, and proactive. Very small (micro) firms may be literally on the "razor's edge" between failure and survival. With success to facilitate growth and resource acquisition a small or medium-sized firm may undertake innovative, risk-taking, and proactive behaviors that micro-firms may not. In other words, larger small firms may be more entrepreneurial in their actions because they have the resources to do so.

Hypothesis 1: There is a positive monotonic relationship between firm size and entrepreneurial orientation. Medium-sized firms exhibit greater levels of EO than do small firms with micro firms showing the lowest levels.

Some of the same arguments made above for the relationship between EO and size are relevant arguments for a relationship between a learning orientation (LO) and size. Given the globalization of markets and the pace of technological change (Ireland and Hitt 1999), firms face the very real prospect of trying to outpace, keep abreast of, or fall behind competitors. In the strategic management literature environmental scanning or understanding industry dynamics (Porter, 1980) has been part of the foundation of research in the field. The process of information gathering, analysis and gaining insight into changing conditions is organization learning (Fiol and Lyles, 1985).

Researchers propose that organization learning in various configurations is an essential antecedent to opportunity recognition (for example, Dutta and Crossan 2005; Lumpkin and Lichtenstein 2005) by entrepreneurs or entrepreneurial firms. Recognized opportunities provide options for strategic renewal or growth (Lumpkin and Lichtenstein 2005), both of which may provide a firm the path to enhanced performance. We propose that SME firms exhibiting an active orientation to learning (Sinkula, Baker & Noordewier, 1997) will likely reveal and recognize opportunities. However, though SMEs in general may be more open to learning, micro-firms may be much more dependent upon learning and adaptation than will be their larger counterparts. Again the "razor's edge" analogy applies requiring micro-firms to absorb information and knowledge quickly to reasonably assure continued survival. Due to the severe resource constraints in micro firms, knowledge acquisition through learning may be a critical element in their continued existence. Medium-sized firms certainly must exhibit the characteristics of a learning orientation, but size may offer a significant resource "cushion" such that the levels of LO may be lower.

Hypothesis 2: There is a negative and monotonic relationship between firm size and learning orientation. Micro firms exhibit greater levels of LO than do small firms with Medium firms showing the lowest levels.

Information technology is viewed as a crucial resource useful to gather, store, and analyze information helpful to the strategic management of firms (Bharadwaj, 2000). Implicit in this view of information technology, as a crucial resource—and consistent with the resource-based view of the firm (Barney, 1991)—is that the gathering, storing and processing of information will yield some contribution to a firm's competitive effectiveness and potentially to competitive advantage. A firm's ability to use information technology effectively to obtain, store, analyze and convey meaningful information necessary for effective decision making has implications for the performance of the firm. Tippins and Sohi (2003) termed this ability information technology competency (ITC).

Though theoretically appealing, the connection between IT activities and enhanced performance outcomes may be weakened by what Lucas (1999) termed the technology productivity paradox. Tippins and Sohi (2003) hypothesized and found support for the proposition that the connection between ITC and performance was indirect through organizational learning. Since Tippins and Sohi (2003) did not report a size measure for the firms included in their study we are left to speculate on the applicability of their findings regarding the ITC relationship to firm size in our research.

To illustrate, large firms are likely to relegate information technology to a functional area within the firm. With departmentalization the likelihood of ITC working through other mechanisms (for example organization learning) may be greater than within firms without such functional area structure. SMEs on the other hand may be less likely to relegate IT to a separable function within the organization structure. SMEs are much more likely to have generalist managers than specialist managers due to the size constraints of the firm. With generalist managers the ITC may be integrated throughout the management team and thus yield a direct relationship with performance outcomes.

Extending these arguments to our examination of size variation within SMEs, the level of specialization and formalization has been shown to grow with the size of the firm. Hence, micro firms are likely to be managed by "jack-of-all-trades" generalists while medium-sized firms may exhibit greater levels of specialization, differentiation, and formalization in structure and management. Thus, on average we expect that micro-firms will exhibit lower levels of ITC than will larger-small firms.

Hypothesis 3: There is a positive monotonic relationship between firm size and IT Competency. Medium-sized firms exhibit greater IT Competency than do small firms with micro-firms lowest.

The hypotheses stated above are straightforward and, on the surface, uncomplicated statements of construct relationships to three within SME size groupings. The exploratory component of this project is to examine the variation in performance levels for the three size groupings. We suspect that if the relationships hold as hypothesized above, there may be no significant difference in the performance levels between the groups. Thus we state our fourth hypothesis in the null form.

Hypothesis 4: There is no relationship between firm size and performance.

METHODOLOGY

Research Design

The research design employed for data gathering in this study was the survey method. A random sample of 700 small- and medium-sized manufacturing firms was selected from a mid-western state. The random sample represented a broad cross-section of firms from a wide array of industries. We mailed a cover letter and survey addressed to the president or owner from each firm soliciting a response to the questionnaire. Responses were returned from 138 key-informants, of which 117 provided complete information. This provided an approximate overall usable response rate of 17 percent, which is consistent with similar studies that survey top management (Hambrick, Geletkanycz, and Fredrickson, 1993).

Measures

Performance

Small- and medium-sized private firms are often reluctant to provide specific information regarding performance. Because of the sensitive nature of the performance construct and following prior research (for example, Chandler and Hanks 1994; Zahra and George 2000) in this area, we employed a categorical approach to assess managerial perceptions of firm performance. We asked respondents to answer three questions concerning their firm's performance level when compared to similar firms in their industry. Each item used a five-point Likert scale format ranging from 1 'lowest 20 percent' to a 5 representing the 'highest 20 percent' which was used as a measure of relative performance levels. The questions asked respondents to compare their firm to the industry for growth in gross profit over the past three years; average gross profit over the past three years; and average after-tax return on sales over the past three years. We labeled this construct "profitability" and deemed it valid because of the single factor loading from a factor analysis and because it had a high reliability of .93.

Entrepreneurial Orientation.

Entrepreneurial orientation was measured using a modified version from Covin and Slevin (1991) and based on prior works of Miller (1983) and Covin and Slevin (1989). The construct was measured by asking respondents twelve (12) questions relating to each dimension - proactiveness, innovativeness and risk-taking. Each dimension included four items, for example in the case of the innovativeness dimension, we asked respondents compared to others in the industry our company emphasizes being first to the market with innovative new products/services; developing new processes; recognizing and developing new markets; and being at the leading edge of technology. Each of the twelve items used was based on a seven-item scale from 1 representing 'strongly disagree' to 7 representing 'strongly agree'. A confirmatory factor analysis was utilized to establish the presence of multidimensionality of the construct. As expected the three dimensions emerged and the scale had an overall reliability of $\alpha = 0.86$. This construct was labeled "entrepreneurial orientation."

Learning Orientation

Similar to Baker and Sinkula (1999), we measured two dimensions of organizational learning, commitment to learning and open-mindedness. The respondents were asked to respond how they either agreed or disagreed with eight items. Each dimension had four items, for example 'commitment to learning' was composed of the following: the ability to learn is the key to our competitive advantage; learning is a basic value throughout our organization; employee learning is viewed as investment, not an expense; and learning is seen as a necessary to guarantee the firm's survival. A seven-point scale ranging from 1 - 'strongly disagree' to a 7 'strongly agree' was used. Confirmatory factor analysis yielded two dimensions as expected with an overall reliability of 0.93. We labeled this construct "learning orientation."

Informational Technology Competency

Respondents were asked fourteen (14) questions concerning the computer-based technology used in their firms, similarly to the approach used by Tippins and Sohi (2003). ITC is based on three dimensions: knowledge (4 items), operations (6 items) and objectives (4 items). Each item used a seven-point Likert type scale ranging from 1 representing 'strongly disagree' to a 7 'strongly agree' based on how each statement applies to your firm's use of computer-based technology. For example the knowledge dimension asked the following four questions - our technical support staff is knowledgeable about computer-based systems; our firm has a high degree of computer-based technical expertise; we are knowledgeable about new computer-based innovations; and we have the knowledge to develop and maintain computer-based communication links. A confirmatory factor analysis provided the expected three-factor solution with a high reliability ($\alpha = 0.93$). We labeled this construct "information technology competency."

Firm Size

Firm size was measured by asking the number of employees currently employed by the firm. Since we were interested in the differences among firms within the SME class we divided the 500 or fewer traditional SME definition into three categories following Wolff and Pett (2000). For statistical analysis our groups were micro-firms (under 25 employees); small-sized firms (26 to 100 employees); and medium-sized firms (101 to 500 employees).

ANALYSIS AND RESULTS

Table 1 reports the means, standard deviations and correlations for the constructs. These findings provide evidence for discriminant validity of the measures employed in this study.

TABLE 1
MEANS, STANDARD DEVIATIONS AND INTERCORRELATIONS OF VARIABLES

Variable (number of items)	Mean	S.D.	1	2	3	4	5
1. Entrepreneurial Orientation	4.75	0.88	(.86)				
2. IT Competency	4.80	1.31	0.44**	(.93)			
3. Learning Orientation	5.73	0.97	0.51***	0.43***	(.94)		
4. Growth Performance	3.62	0.84	0.28**	0.21**	0.26**	(.83)	
5. Profit Performance	3.35	1.01	0.12	0.11	0.08	0.57***	(.94)

N = 115. * *p* < 0.05; ** *p* < 0.01; *** *p* < 0.001 (Cronbach alpha's are reported on the diagonal)

Data Analysis

The purpose of our study was to examine the differences in entrepreneurial orientation, IT competency and learning among small firms, whether size plays a role in those differences, and the relationship between these and performance. To address the issues, the analysis of variance (ANOVA) statistical procedure was used to determine if any differences among the three firm-size groups (micro, small, and medium) were statistically significant. The results provide some interesting findings for small firms concerning the different entrepreneurial orientation, IT competency, learning, and performance. The results are discussed in more detail next.

Results

Table 2 reports the means for entrepreneurial orientation, IT competency and learning orientation for each of the three firm-size categories. The overall firm-size mean for our sample was 92.70 (s.d. 43.14) employees. The micro-firm category (1-25 people) consisted of 34 firms with a mean of 17.18 (s.d. 5.37) employees. The small-firm category (26-100 people) contained 51 firms with mean size 60.06 (s.d. 23.95), while the medium-firm category (101-500 employees) included 30 firms with a mean of 233.77 (s.d. 110.78) employees. The first set of results addresses the question of whether or not firm size is related to entrepreneurial orientation. The findings indicate some significant differences among the three size categories on the dimensions of interest in this study.

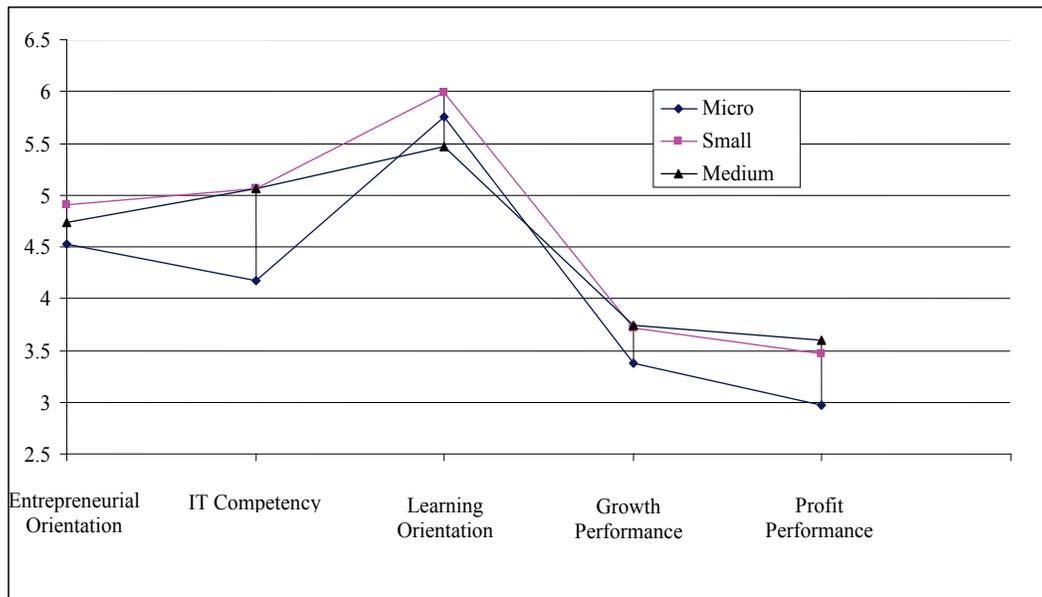
TABLE 2
ANOVA RESULTS OF GROUP DIFFERENCES FOR FIRMS

	Micro Firms (1-25 employees) n=34	Small Firms (26-100 employees) n=51	Medium Firms (101-500 employees) n=30
Entrepreneurial	4.52* ^a	4.91 ^a	4.74
Proactiveness	4.86* ^a	5.21 ^a	5.07
Risk Taking	4.08	4.34	4.37
Innovation	4.61* ^a	5.17 ^a	4.77
IT Competency:	4.17*** ^{a,b}	5.06 ^a	5.06 ^b
Knowledge	4.05*** ^{a,b}	5.11	5.08
Operations	4.55** ^{a,b}	5.20	5.08
Objectives	3.70*** ^{a,b}	4.81	5.01
Organizational Learning:	5.75*** ^a	5.99*** ^{a,c}	5.37*** ^c
Commitment	5.41* ^a	5.89* ^{a,c}	5.28* ^c
Open Mindedness	5.72* ^a	6.08* ^{a,c}	5.67* ^c
Performance Growth	3.38	3.71	3.74
Performance Profit	2.97*** ^{ab}	3.47 ^a	3.60 ^b

^a Micro different from Small; ^b Micro different from Medium; ^c Small different from Medium.
* p < .10; ** p < .05; *** p < .01

The micro-firms recorded the lowest mean score for entrepreneurial orientation (4.52) and was significantly different (p<.10) from the small-firm category. The medium-sized group reported the highest mean response (4.91). However, the , risk taking and innovation. The results reported in Table 2 reveal significant differences (p<.differences between groups 2 and 3 were not statistically significant. A closer examination of the differences was completed on each dimension of the entrepreneurial orientation scale, including proactiveness10) between micro and small-sized firms on the proactiveness and innovation dimensions. No statistically significant differences exist among the groups for the risk taking dimension. These results are graphically illustrated in Figure 1. The outcomes suggest that entrepreneurial orientation differs in measurable ways across the three size categories. This lends at least partial support for Hypotheses 1.

FIGURE 1
GRAPHICAL REPRESENTATION OF ANOVA RESULTS FOR GROUP DIFFERENCES



The second set of ANOVAs examined IT competency against the three size groupings. The results reported in Table 2 show that the micro firms had the lowest overall mean score (4.17) and was significantly different ($p < .01$) from both the small and medium-sized firms. The small and medium-sized firms reported the highest mean scores (5.06, $p < .01$). An examination of the differences was also completed on each of the three dimensions (knowledge, operations and objects) of the IT competency scale. The results reported in Table 2 again found significant ($p < .01$) differences between micro and small-sized firms for knowledge, operations and objectives. The differences between small and medium firms were not significant on the three components of IT competency. These results are also illustrated in Figure 1. These findings lend partial support for Hypothesis 2.

The next examination looked at learning orientation and firm size. The results reported in Table 2 show that small firms had the highest overall mean score (5.99) and was significantly different ($p < .001$) from both the micro- and medium-sized firm groups. The micro-firm group reported the second highest mean scores (5.75), while the medium-sized firm group recorded the lowest score (5.47). An examination was also completed on each of the two dimensions of learning orientation, commitment and open mindedness. The results reported in Table 2 again found significant differences ($p < .01$) as above (see Table 2). These findings demonstrate some support for Hypothesis 3 and are illustrated in Figure 1.

The final set of ANOVAs examined both measures of performance and firm size. The results reported in Table 2 show that the micro firms had the lowest mean scores for both growth (3.38) and profit (2.97). However, only the profit measure was significantly different ($p < .001$) from the small (3.47) and medium-sized (3.60) firms. In fact, although not significant the larger firms did have the highest mean scores for both measures of performance. These findings are also illustrated in Figure 1 and provide support for our Hypothesis 4 on the growth dimension but no support on the profit dimension.

Implications

The practical implications for the findings in this report are informational for managers of the different sized firms. We compare micro firms (1-25 employees), small firms (26-100 employees), and medium-sized firms (101-500 employees). Our reason for this examination is the vast difference in resources likely to be brought to bear by a 10 person firm compared to a 400 person firm. While both

firms are technically SMEs, the 400-person firm has 40 times the people and likely other resources it can bring to bear on its business activities.

We find significant differences on most of the dimensions important for small and medium-sized firms. For example a counter-intuitive finding is that micro and small-firms exhibit lower levels of EO than do medium-sized firms. Also as expected medium-sized firms exhibit higher levels of ITC than do small-firms with micro-firms exhibiting the lowest levels. A learning orientation is more prevalent in micro- and small firms than in medium-sized firms, and interestingly it is highest in small-firms. We find no significant difference between size classes with respect to performance as growth, but medium-sized firms perceive significantly higher when it comes to profitability.

The practical implications of our findings are that managers and organizational leaders control the three dimensions leading to the performance outcomes. For example in the medium-sized firms, fostering a learning orientation may require more effort to instill in the organization because of size. In micro firms creating an entrepreneurial orientation may require significant effort on the part of managers. In each case the increased effort on these dimensions may pay dividends through improved profit performance.

Discussion and Conclusions

As stated in the introduction of this paper our goal was to examine SMEs with respect to the potential for within size class differences. Our original contention that SMEs may be similar or the same on some important dimensions and very different along other important dimensions was borne out by the data from our sample. Although hypothesized relationships were not fully supported by the data, partial support was evident in situations where full support did not occur. The results indicate that there are meaningful and significant differences in subgroups within the classification of SMEs. Discerning meaningful differences is a contribution of this research project because it adds to our understanding of SMEs as a class of firms—within class size makes a difference.

The findings of this research paper offer a unique perspective for SME researchers and managers. Regarding the first construct examined—EO—smaller firms may be viewed as very entrepreneurial out of necessity. However, the resource-based notions (Barney 1991) employed in our arguments indicate that, counter to intuition, having a positive orientation toward risk taking, innovation, and being proactive in their business environment may be luxuries afforded by the resources to facilitate such behaviors. Our data and results suggest that micro-firms reflect less of an entrepreneurial orientation than either small or medium-sized firms. Consistent with the resource-based view, the management teams of micro firms—while entrepreneurial at the outset—need to establish their legitimacy with both business partners and customers. Thus, taking risks, innovating (beyond what initially was the impetus for the business), and being proactive may be counter-productive to establishing legitimacy. As a firm grows to reach a point where survival is not an overriding question and continued growth is, management may become aware that risk-taking, innovation and proactive behaviors may be necessary. It is clear from our results that differences exist among the size groups and future examination by research may lead to helpful understanding.

The study also examined the relationship between IT competency and firm size. Top management and members of management teams that understand the importance of information technology and develop the competency to effectively use IT may be able to reap dividends on the profit performance end. Our study found large and significant differences between the size classes of firms. Consistent with our expectations smaller firms exhibit lower levels of IT competency than do their larger counterparts. The ability to gather, store and analyze information to facilitate better decision making within the firm may be crucial to future firm growth and profitability. Micro firms may jeopardize their future growth and performance prospects by not exploiting information technology tools that are available. Our results seem to suggest that micro-firms emphasize or utilize such technologies less than do small- and medium-sized firms.

Although we did find that an organizational learning orientation was high for micro-firms, it was significantly higher for small-sized firm. Our study suggests that top managers and management teams of small and micro-size firms engage in the learning orientation dimensions of open mindedness and

commitment to learning significantly more than do medium-sized firms. This is not an unexpected result. Micro- and small-firm boundaries are very near to the core of the organization. Knowledge, information, and events have fewer layers to penetrate and learning facilitates adaptation by the organization to its environment. The challenge is for managers in medium-sized firms to retain a learning orientation given the more formalized and differentiated structure required of the larger size.

Finally, as expected, we found that firm growth exhibited limited variability across the size groups and is an important for managers of businesses regardless of size. Additionally, managers of larger firms seemed to also emphasize profitability more than smaller firms. This outcome may be explained by micro-firm managers and owners striving to grow their firm by investing what may have been profit back into the firm to fuel growth. Finally all four of the constructs examined in this study may work together to facilitate better and more effective actions and decisions made by the leaders and managers of the businesses.

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