

LINKING CORPORATE ENTREPRENEURSHIP AND CULTURE TO FIRM PERFORMANCE IN THE SOUTH AFRICAN ICT SECTOR

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Abstract: The ICT sector in South Africa is pivotal to economic development, and innovation as a corporate strategy is a logical response to the presence of industry related environmental conditions, in terms of competitive intensity, technological change and evolving product-market domains. Despite the importance of this sector, little in-depth research regarding corporate entrepreneurship has been undertaken in the ICT industry context. This study contributes to existing literature and extends current knowledge of corporate entrepreneurship by linking it with culture and firm performance. Based on a web-survey, 114 firms in the ICT sector were studied in terms of any evidence of an entrepreneurial orientation and culture, as well as organisational performance which was measured with various growth indicators. The empirical findings emanating from this study show that the entrepreneurship orientation and culture have a significant and positive relationship with higher company performance, adding support to all of the study hypotheses. The study provides guidance to managers and company leaders interested in undertaking intrapreneurial practices and accessing links to firm performance.

Key phrases: corporate entrepreneurship, ICT sector, innovation, firm performance,

1 INTRODUCTION

Corporate Entrepreneurship (CE) is widely recognised as a viable means for promoting and sustaining corporate competitiveness and performance (Covin & Miles 1999; Groenewald & Van Vuuren 2011; Morris, Kuratko & Covin 2008; Vozikis, Bruton, Prasad & Merikas 1999). The presence of CE leads to positive outcomes (Ireland, Covin & Kuratko 2009:21), where top management needs to adopt an entrepreneurial strategy and be able to cascade this through different levels within the company. Entrepreneurial behaviour by management and employees has been linked to a firm's competitive advantage and sustainability (Dess, Lumpkin & McGee 1999:86; Landstrom, Crijns, Lavern & Smallbone 2008; Zahra & Covin 1995).

Entrepreneurship within organisations is a fundamental posture, instrumentally important to strategic innovation, particularly under shifting external environmental conditions (Knight 1997:214; Urban 2010a:56). Adopting an entrepreneurial strategic vision is a logical response to the presence of industry related environmental conditions,

in terms of competitive intensity, technological change and evolving product-market domains (Anderson, Covin & Slevin 2009:220; Ireland, Covin & Kuratko 2009:23). The information and communication technology (ICT) industry is one such environment characterised by rapid change and shortened product and business lifecycle, where the future profit streams from existing operations are uncertain and firms need constantly to seek out new opportunities (Rauch, Wiklund, Lumpkin & Frese 2009:763; Wang 2008:637).

Technology-based firms can play a number of important roles in any industry and economy. Such firms can facilitate change within an industry by introducing both product and process innovations which force larger, more-established firms to rethink their technologies and operations. Additionally, technology enterprises can provide societal value by helping to expand the tax base, strengthen national competitiveness and generate highly skilled jobs (Preece, Miles & Baetz 1998:261).

The important role that technology enterprises can play in the development of emerging economies is being increasingly recognised (Preece *et al.* 1998:259; Wright, Hmielecki, Siegel & Ensley 2007:794). The ICT sector in South Africa is facing rapid technological changes, where firms are required to remain innovative to maintain their competitive advantage and sustainability (Covin & Miles 1999; Moreno & Casillas 2008; Wakkee, Elfring & Monaghan 2010; Wiklund 2009).

The ICT sector in South Africa, is pivotal to economic development, and innovation as a turnkey strategy of globalisation, particularly in telecommunications, in terms of identified national policy objectives which include promoting the convergence of telecommunications, broadcasting and information technologies; the development of interoperable and interconnected electronic networks; technologically neutral licensing; universal access and connectivity for all; investment and innovation in communications; efficient use of radio spectrum; and the promotion of competition (Esselaar, Gillwald, Moyo & Naidoo 2010:7; Hoffmann & Marcus 2011:95).

2 PURPOSE OF STUDY AND AIMS

Despite the importance of this sector, little in-depth research regarding CE has been undertaken in the ICT industry context, with an absence of empirical studies testing the relationship between CE activities and firm performance. Consequently it has been argued that if CE is to be employed by ICT companies as a strategy for survival, it is critical that this link be empirically investigated in the context of this industry. This problem is reinforced when Gries and Naude (2010:29) suggest that firms need to develop new and improved products and services, as well as better operating technology and methods that are more effective than those of competitors to ensure a competitive advantage. Indeed many firms are seeking to transform their organisations and particularly to use entrepreneurial orientation (EO) as a way of combating the lethargy and bureaucracy that often accompany business size and cultural lock-ins (Burns 2004:21).

It is imperative to note that in every organisation, there is an element of EO and within the most bureaucratic organisations there exists some element of highly entrepreneurial people (Morris *et al.* 2008:366; Van Vuuren, Groenewald & Gantsho 2009:327). Additionally, entrepreneurially oriented companies tend to establish clear and meaningful core values and ensure they are shared within the organisation (Morris *et al.* 2008:56). Entrepreneurial organisations are guided by their vision, and exhibit a sustained form of CE through cultures and systems supportive of innovation (Covin & Miles 1999:49). An entrepreneurial culture stimulates innovation, flexibility and performance (Lumpkin & Dess 1996:137), and should be encouraged throughout the organisation by fostering an entrepreneurial climate (Venter, Urban & Rwigema 2008:506).

The research question this study seeks to address is whether or not there are any significant relationships or links between the various dimensions of EO, entrepreneurial culture and financial measures of firm performance in the South African ICT sector. Building on existing theoretical and conceptual frameworks, this study has relevance to academics, senior decision makers, and practitioners. The study contributes to existing literature and extends current knowledge of the EO construct by linking it with culture

and applying it to an under-researched context, the ICT sector in an emerging market context (Perks, Muteti, Pietersen & Bosch 2010:541). The study aids in understanding the nexus between the various dimensions of EO and performance, thereby advancing the knowledge of entrepreneurial practices in this highly dynamic and competitive industry.

A deep and thorough understanding of the nexus between entrepreneurship at the firm level and firm performance is important not only for academic purposes but also has salience for practitioners and policy makers. These implications relate to firm profitability and competitiveness as well as to the overall economic performance of the ICT industry and the national economy.

The study starts by briefly reviewing past research on CE, EO, culture and performance in order to operationalise the constructs under investigation. The research methodology is then delineated, in terms of sampling, instrument design, and data analysis best suited to test the hypotheses. The results are scrutinized in terms of previous theory and interpreted from an industry specific perspective. Both theoretical and practical implications are drawn from the empirical evidence, and recommendations for future research are made.

3 LITERATURE REVIEW

3.1 Corporate Entrepreneurship

A longstanding literature has conceptualised CE as a multidimensional phenomenon which incorporates the behaviour and interactions of the individual, organisational, and environmental elements within organisations (Antoncic & Hisrich 2001; Dess *et al.* 1999; Hayton, George & Zahra 2002; Phan, Wright, Ucbasaran & Tan 2009). CE includes strategic renewal (organisational renewal involving major strategic and/or structural changes), innovation (the introduction of something new to the marketplace), and corporate venturing (corporate entrepreneurial efforts that lead to the creation of new companies within the corporate company), all of which have identified as important and legitimate parts of the CE process (Covin & Miles 1999:52; Kuratko, Ireland & Hornsby 2001:61; Morris & Kuratko 2002:34).

By adopting CE practices companies are able to maintain and increase their sustainable competitive capabilities, which are fostered by different areas of organisational performance (Agca, Topal & Kaya 2009:3; Lumpkin & Dess 1996, 2001; Ireland *et al.* 2009).

3.2 Entrepreneurial Orientation

For CE to become a meaningful strategy it cannot be confined to a specialist function within the organisation, but rather requires support through an entire pro-entrepreneurship organisational architecture that contains key attributes that individually and collectively encourage entrepreneurial behaviour. This type of entrepreneurial behaviour is manifested through a firm's entrepreneurial orientation (EO). EO incorporates firm-level processes, practices and decision-making styles (Lumpkin & Dess 1996:136) where entrepreneurial behavioural patterns are recurring (Covin & Slevin 1991:8; Dess *et al.* 2003:361).

Firms with higher levels of EO would reflect consistent behaviour required to enact a CE strategy as captured in the CE strategy model through entrepreneurial processes and behaviour, including its EO (Ireland *et al.* 2009:26; Pienaar & Du Toit 2009:123). EO is one of the prerequisites for organisational success, where Antoncic and Hisrich (2004:519), point out that any organisation with high levels of EO tends to be innovative and encourages creative initiatives in new products and service development, particularly in the space of advancement of new technologies and novel ideas.

3.3 Organisational Performance

Organisational performance in a fast and changing environment requires an entrepreneurial approach, where Huse, Neubaum and Gabrielsson (2005:315) maintain that emerging global markets and rapid technological developments make strong demands on the ability of companies to develop and utilise their resources in order to meet their customer demands. These firms are flexible to environmental dynamics, which allows them to identify new opportunities caused by disequilibrium (Huse *et al.* 2005:316). Several studies have empirically tested the influence of CE and EO on

company performance and sustainability (Sebora & Theerapatvong 2009:5; Ireland *et al.* 2009:25; Zahra & Covin 1995:45; Lumpkin & Dess 1996:138).

For instance Wiklund (1999:39) finds that the impact of CE on company performance has a positive effect. In Wiklund study's the results indicate a strong relationship over time, which means that CE is effective within the organisation over a certain period. Similarly Zahra and Garvis (1998:469) report that CE is positively associated with company performance, where the EO dimension of innovation has a more positive relationship with company performance, especially if it is an international company. Moreover, CE has also been identified as an important predictor of company growth in the South African context (Urban 2010b:3, Urban & Oosthuizen 2009:174). Higher growth tends to be associated with firms that support entrepreneurial behaviour and display an entrepreneurial culture (Moreno & Casillas 2008:509).

3.4 Entrepreneurial Orientation and Organisational Performance

The EO construct is salient not only for large organisations but also for small and medium-sized organisations, under different stages of economic development, in varied cultural contexts (Lumpkin & Dess 1996, 2001). The theoretical basis of the EO construct lies in the assumption that all firms have an EO, even if levels of EO are very low. Extensive research confirms that EO has three dimensions: innovativeness, risk taking, and proactiveness (Covin & Slevin 1989, 1991, 1997; Kreiser, Marino & Weaver 2002). These dimensions have been extensively documented, and according to Lumpkin and Dess (1996:156), all the dimensions are central to understanding the entrepreneurial process, although they may occur in different combinations, depending on type of entrepreneurial opportunity the firm pursues.

The different EO dimensions and the construct of entrepreneurial culture are briefly delineated in terms of their potential influence on firm performance. Innovativeness is the fundamental posture of an entrepreneurial organisation in terms of developing new products or inventing new processes (Drucker 1979; Schumpeter 1934). According to Huse *et al.* (2005), and Venter *et al.* (2008:514), firms operating in turbulent environments are often characterised by rapid and frequent new product creation and

high levels of research and development. Risk taking involves taking bold actions by venturing into the unknown, borrowing heavily and/or committing significant resources to ventures in uncertain environments (Wang 2008; Lumpkin, Cogliser & Schneider 2009; Rauch *et al.* 2009; Zahra and Garvis 1998:471). Risk-taking, according to Yi and Lau (2008:38), is a commitment to experimentation in the face of uncertainty. Subsequently these activities can enhance the company's ability to recognise and exploit market opportunities ahead of its competitors and improve performance (Hitt, Ireland, Camp & Sexton 2002; Kreizer & Davis 2010:41). Proactiveness is perseverance in ensuring initiatives is implemented, and is concerned with adaptability and tolerance of failure (Lumpkin & Dess 1996). According to Zahra, Nielsen and Bogner (1999), proactiveness such as first entry, can improve a firm's performance.

Wang (2008) reports that culture is an important controlling instrument for CE practices, because it provides a space for taking risks and a certain degree of immunity from failure. An entrepreneurial culture at a firm empowers its people and gives them freedom to decide and act by devolving decision-making authority (Morris *et al.* 2008). Entrepreneurship may be encouraged in an organisation by creating an appropriate entrepreneurial culture and fostering an entrepreneurial climate (Venter *et al.* 2008). Entrepreneurship culture encourages learning through information sharing, commitment and accountability (Morris *et al.* 2008). As innovation is a key element of EO, it can be influenced by cultural factors of different countries (Huse *et al.* 2005). Zahra *et al* (1999) indicate that the culture that reinforces communication and sharing of knowledge within the organisation is a crucial element of success in encouraging the implementing of new ideas. Entrepreneurial firms are more prone to having a market-driven culture by constantly updating, improving and changing business processes, products and services that eventually create more value for customers (Agca *et al.* 2009).

Firms can only be labelled as entrepreneurial if they are simultaneously risk taking, innovative, and proactive, and have an entrepreneurial culture (Covin & Slevin 2002; Urban & Oosthuizen 2009). Consequently an overall first hypothesis is formulated to reflect the consolidated nature of EO on firm performance. Four separate hypotheses

are further formulated to discern if any associations between the EO dimensions, entrepreneurial culture and firm performance is evident. The formulation of these hypotheses allows for the testing of both one-dimensional and the multidimensional levels of the EO construct.

Hypothesis 1: Higher levels of EO and culture are positively associated with higher levels of firm performance in the South African ICT sector

Hypothesis 2: The EO dimension of innovation is positively related with higher levels of firm performance in the South African ICT sector

Hypothesis 3: The EO dimension of risk-taking is positively related with higher levels of firm performance in the South African ICT sector

Hypothesis 4: The EO dimension of pro-activeness is positively related with higher levels of firm performance in the South African ICT sector

Hypothesis 5: Higher levels of entrepreneurial culture is positively related with higher levels of firm performance in the South African ICT sector

4 RESEARCH METHODOLOGY

The research relies on a quantitative cross-sectional empirical approach which is based on primary data sources. The context of the study is the South African ICT industry. By focusing on a single industry sector, a greater homogeneity of context is achieved which addresses the concerns of broad applicability versus perfect suitability for narrower groups. Studies across industries often produce results that apply to all while they at the same time apply to none (Davidsson 2004). Consequently the focus is on a single industry. The important issue about sampling, in general, is not statistical but theoretical representativeness, i.e., the elements in the sample represents the type of phenomenon that the theory makes statements about (Davidsson 2004).

4.1 Sampling and data collection

The population of this research study comprises of all ICT companies listed in the South African ICT sector review 2009/2010. The research study used a database which has listed and non-listed ICT companies operating in all provinces in South Africa.

Company data was obtained from the ITWEB website (www.itweb.co.za) and the South African ICT sector review 2009/2010 (Esselaar *et al.* 2010).

A research design involving a web-based self-reporting survey instrument was used. The survey was distributed via 'Surveymonkey', which was selected principally because of its functionality and more importantly since it was considered suitable for the target population who are likely to use online resources regularly. The sampling frame included firms such as web designers, cellular phone assembling, computer networking, data services, cabling, to cellular network providers. The questionnaires were sent through a web-link (www.surveymonkey.co.za) to ICT managers, directors, CEOs and supervisors in terms of the sampling frame. Consistent with previous studies (Wiklund 1999) control variables included, firm age and firm size. The survey was sent to 267 firms, with a response rate of 42.7% obtained. A final sample size of n=114 firms was deemed to be appropriate for an empirical survey based study.

4.2 The research instrument

The survey collected quantitative, closed-ended questions. The questionnaires used the 5-point Likert scale, which has been used previously in similar studies (Monsen & Boss 2009; Wakkee, Elfring & Monaghan 2010). The questionnaire was structured to determine levels of the EO dimensions, entrepreneurial culture and firm performance among the sample of firms selected.

The content section of the instrument was designed to reflect the EO dimensions of innovation, risk-taking and proactiveness, consisting of nine items. Many alternative EO conceptualisations are to be found (Brown, Davidsson & Wiklund 2001), and have demonstrated some usefulness, however as Davidsson (2004) suggests using the existing EO measure has the advantage of theoretical backing, a multidimensional construct, and theoretically meaningful relationships established in previous studies, thus allowing for more refined knowledge to evolve.

The EO dimensions have evolved from the ENTRESCALE, which was derived at by identifying the innovative and proactive disposition of managers at firms. This scale initially developed by Khandwalla (1977), refined by Miller and Friesen (1983), and

Covin and Slevin (1989), has been found to be highly valid and reliable at cross-cultural levels (Knight 1997).

Entrepreneurial culture was measured in terms of the eight items highlighted in the literature review section (Morris *et al.* 2008). These items have been found to represent the core construct of entrepreneurial culture, and have been previously associated with higher performing firms (Lumpkin & Dess 1996; Morris *et al.* 2008; Venter *et al.* 2008). Both of these instruments utilized in different studies were scrutinised for construct validity and reliability, and based on the mere weight of writing supporting the application of these instruments confirms that their use is justified.

Considering that evidence for discriminant and convergent validity of measures already exists, only the reliability of scale was re-tested for this sample of respondents. Internal consistency reliability coefficients, as measured by Cronbach's coefficient, were for the EO dimension of innovation = 0.80; risk-taking = 0.81; pro-activeness = 0.84; and for entrepreneurial culture = 0.88, all of which are well within the accepted norm of 0.70 (Nunnally 1978).

Organisational performance was measured in terms of various growth indicators. Although there is no consensus on the appropriate measure of firm growth, entrepreneurship researchers have pointed to multidimensional nature of growth as the crucial indicator of entrepreneurial success (Covin & Slevin 1997; Low & MacMillan 1998). Consequently, sales performance, return on assets (ROA), employment growth, return on sales, return on equity (ROE), return on investment (ROI), and operating profit were used to measure financial performance. The respondents were asked to consider firm performance in terms of these indicators over a period of five years.

In order to ensure the instrument had face and content validity, a preliminary analysis via a pilot test was undertaken. A pilot test was conducted by sending the instrument to a leading ICT firm – Vodacom SA, where errors in the survey, such as "allow one answer per column", were corrected. This process allowed the researcher to refine the questionnaire design. This procedure ensured that the respondents had no difficulties in answering the questions and there was no problem in recording the data.

4.3 Data analysis techniques

Data analysis was conducted, where descriptive and inferential statistics were calculated using the STATISTICA software system, version 10 (StatSoft 2011). Since firm performance was measured with multiple ordinal variables, in order to analyse these variables in relation to EO and culture, three performance categories (Poor, Moderate and High) were developed to make it more practical for analyses and presentation.

A logical test was done to check the overall company performance. The scale numbers of 1's and 2's were counted for each company - these were regarded as 'poor performance'. The scale number 3's was manipulated and these were regarded as 'moderate performance'. The scale number of 4's and 5s were manipulated and these were regarded as 'high performance'. Multivariate and univariate analyses of variance (ANOVA) tests were used to test the hypotheses. Box and Whisker Plots were additionally drawn to scrutinize the hypotheses.

5 DISCUSSION OF THE RESULTS

Table 1 refers to firm age and size, where it is observed that the majority of respondents was large (57%) and established (46.5%) companies.

TABLE 1: FIRM AGE AND SIZE

| | Count | % |
|------------------|-------|------|
| Firm size | | |
| Micro | 4 | 3.5 |
| Small | 16 | 14.0 |
| Medium | 29 | 25.4 |
| Large | 65 | 57.0 |
| Total | 114 | 100 |
| Firm age | | |
| 1-5 years | 13 | 11.4 |
| 6-10 years | 24 | 21.1 |
| 11-14 years | 24 | 21.1 |
| 15 years + | 53 | 46.5 |
| Total | 114 | 100 |

TABLE 2: GROWTH INDICATORS

| | Count | Cumulative Count | Percentage | Cumulative % |
|-------------------------------------|-------|------------------|------------|--------------|
| Sales growth | | | | |
| 0-10% | 17 | 17 | 14.91 | 14.91 |
| 11-40% | 48 | 65 | 42.11 | 57.02 |
| 41-80% | 27 | 92 | 23.68 | 80.70 |
| 81% or more | 22 | 114 | 19.30 | 100 |
| Market value growth | | | | |
| 0-10% | 31 | 31 | 27.19 | 27.19 |
| 11-40% | 41 | 72 | 35.96 | 63.16 |
| 41-80% | 27 | 99 | 23.68 | 86.84 |
| 81% or more | 15 | 114 | 13.16 | 100 |
| Employment growth rate | | | | |
| Less than 0% (-ve) | 5 | 5 | 4.39 | 4.39 |
| 0-10% | 27 | 32 | 23.68 | 28.07 |
| 11-40% | 43 | 75 | 37.72 | 65.79 |
| 41-80% | 25 | 100 | 21.93 | 87.72 |
| 81% or more | 14 | 114 | 12.28 | 100 |
| ROI | | | | |
| 0-10% | 17 | 17 | 14.91 | 14.91 |
| 11-40% | 40 | 57 | 35.09 | 50 |
| 41-80% | 36 | 93 | 31.58 | 81.58 |
| 81% or more | 21 | 114 | 18.42 | 100 |
| Return on equity | | | | |
| 0-10% | 20 | 20 | 17.54 | 17.54 |
| 11-40% | 36 | 56 | 31.58 | 49.12 |
| 41-80% | 41 | 97 | 35.96 | 85.09 |
| 81% or more | 17 | 114 | 14.91 | 100 |
| Return on assets | | | | |
| Less than 0% (-ve) | 1 | 1 | 0.88 | 0.88 |
| 0-10% | 17 | 18 | 14.91 | 15.79 |
| 11-40% | 35 | 53 | 30.70 | 46.49 |
| 41-80% | 44 | 97 | 38.60 | 85.09 |
| 81% or more | 17 | 114 | 14.91 | 100 |
| Return on sales | | | | |
| 0-10% | 23 | 23 | 20.18 | 20.18 |
| 11-40% | 41 | 64 | 35.96 | 56.14 |
| 41-80% | 35 | 99 | 30.70 | 86.84 |
| 81% or more | 15 | 114 | 13.16 | 100.00 |
| Operating profit growth rate | | | | |
| Less than 0% (-ve) | 3 | 3 | 2.63 | 2.63 |
| 0-10% | 14 | 17 | 12.28 | 14.91 |
| 11-40% | 37 | 54 | 32.46 | 47.37 |
| 41-80% | 35 | 89 | 30.70 | 78.07 |
| 81% or more | 25 | 114 | 21.93 | 100 |

Based on the grouping of firm performance as described above in the data analysis section and in Table 2, the groups were compared across the EO dimensions and culture simultaneously in terms of hypothesis 1.

This multivariate test was conducted to test the means of multiple independent variables, compared to different groups of dependent variables (Cooper & Emory 1995). Figure 1 shows the results obtained after running the multivariate test simultaneously across variables. This multivariate comparison is an overall comparison, at the 5% level of significance, that controls the experiment-wise compounding of the Type 1 error that would have occurred had four univariate comparisons been carried out using a 5% level of significance.

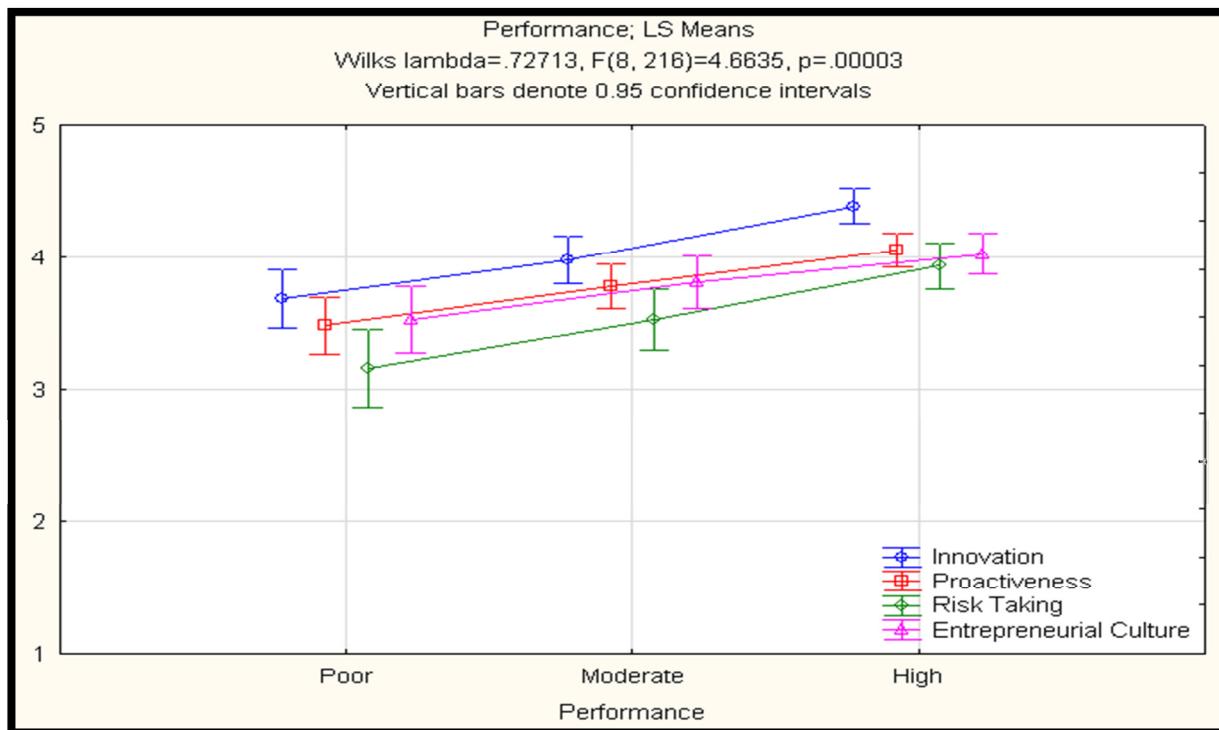


FIGURE 1: MULTIVARIATE COMPARISON OF THE MEANS OF THE EO DIMENSIONS AND CULTURE ACROSS THE THREE COMPANY PERFORMANCE CATEGORIES

A significant difference between the EO dimensions, entrepreneurial culture and the different firm performance groups was observed when running the multivariate test. A p value ($p = 0.00003$) was obtained which is significant at 95% confidence level. From this, the null hypothesis is rejected and the alternative hypotheses (as formulated in this

study) can be supported. This empirical test confirms that there is a significant association between EO dimensions, culture and company performance.

5.1 Hypotheses Testing Results

Following the multivariate tests, each hypothesis was tested independently in line with formulations, which entailed conducting univariate analyses of variance (ANOVA) tests. All of the one-way ANOVA tests were significant at the $p < .05000$ level, see results in table 3.

TABLE 3: ANOVA RESULTS FOR EO DIMENSIONS AND CULTURE

| | SS Effect | df Effect | MS Effect | SS Error | df Error | MS Error | F | p |
|----------------------------|--------------|--------------|--------------|-------------|----------|-------------|-------|------|
| Innovation | 8.71 | 2 | 4.35 | 30.07 | 111 | 0.27 | 16.08 | 0.00 |
| Pro-activeness | 5.39 | 2 | 2.70 | 27.11 | 111 | 0.24 | 11.04 | 0.00 |
| Risk Taking | 10.35 | 2 | 5.18 | 50.81 | 111 | 0.46 | 11.31 | 0.00 |
| Entrepreneurial Culture | 4.07 | 2 | 2.03 | 38.00 | 111 | 0.34 | 5.94 | 0.00 |

However, in order to establish the source of the significant difference between the means of these scores, the Scheffe test was performed to compare the means of the different performance groups relevant to each independent variable. The results show that there is no significant difference between 'poor and moderate firm performance' groups. Hence these two groups were combined into a single group representing the 'poor/moderate performance' category.

These groupings were then used for the remainder of the data analysis. Additionally, t-tests were conducted to compare the means of these two firm performance groups to investigate if they are significant in terms of the hypothesized relationships. The results from the t-tests satisfied the conditions for homogeneity of variance between the groups and, moreover, revealed significant mean differences.

When the values of significance levels were considered for directional t-tests, all four t-tests on innovation, pro-activeness, risk taking and culture were significant at the 0.1% level. Moreover, the pair-wise means were consistently higher for the 'high performance'

group when compared to the 'poor/moderate performance' group. These results provide preliminary support for the hypotheses.

In terms of hypothesis 2, the association between the EO dimension of innovation and company performance was tested using ANOVA, which compares the means of different groups. The results indicate a significant difference between the groups, rather than within the groups. The significance level of $p < 0.05$ was obtained, which provides support for hypothesis 2. A t-test was then performed for the two firm performance groups – (1) high performance and (2) poor/moderate performance. In terms of the EO dimension of innovation, a significant difference between the means of these two groups was detected at the $p < 0.05$ level.

A box and whisker plot was then plotted to check for the range of the minimum, first quartile, median, second quartile and maximum values (Cooper & Emory 1995). The outliers were checked through this method. The observed results from Figure 2 of the box-whisker plot depicts that higher levels of EO innovation are associated with the 'high performance' group and organisations with lower levels of innovation are associated with the 'poor/moderate performance' group. These associations are significant at $p < 0.05$ level, which adds support to hypothesis 2. Moreover there was no overlapping observed on the box and whisker plot and there is a clear separation between the 'high and poor/moderate performing' groups. This indicates that these groups are significantly different.

In terms of hypothesis 3, the same procedure was conducted. The ANOVA test results show significant difference between the groups, rather than within the groups, at the $p < 0.05$ level, which supports hypothesis 3. Similarly the t-test results reveal a significant difference between the means of these two groups.

The box and whisker plot shown in Figure 3 was calculated to test the level of pro-activeness in relation to the two performance groups. A significant difference at the $p < 0.05$ level, providing support for hypothesis 3, between the two performance groups was observed when the mean levels of pro-activeness were examined. The observed results of the box-whisker plot depicts that higher levels of pro-activeness are associated with

the 'high performance' group, and organisations with lower levels of pro-activeness tend to have 'poor/moderate performance'.

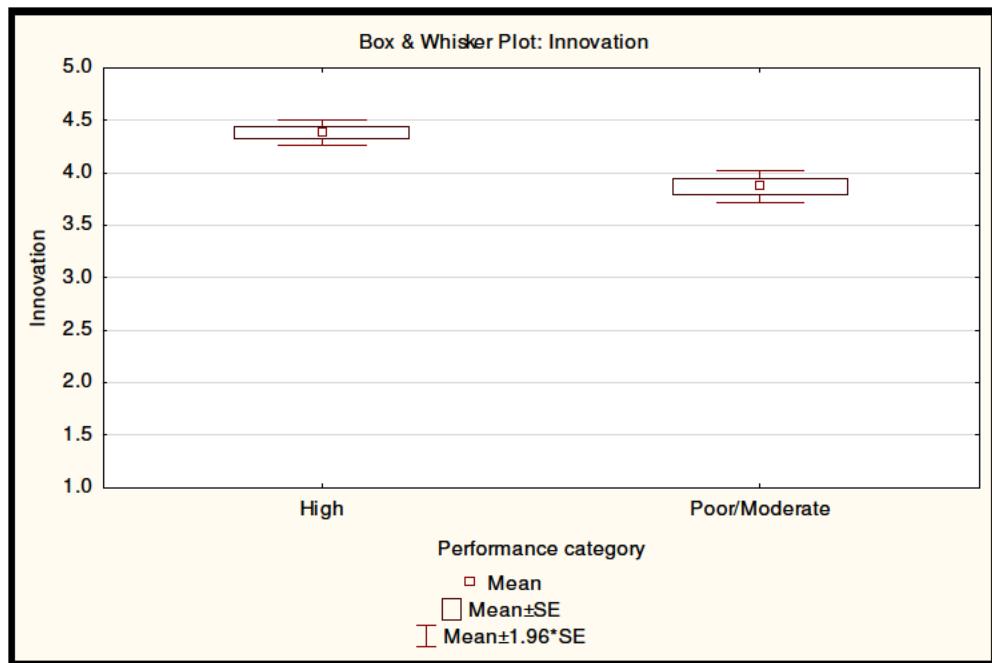


FIGURE 2: BOX & WHISKER PLOT: EO DIMENSION OF INNOVATION AND FIRM PERFORMANCE

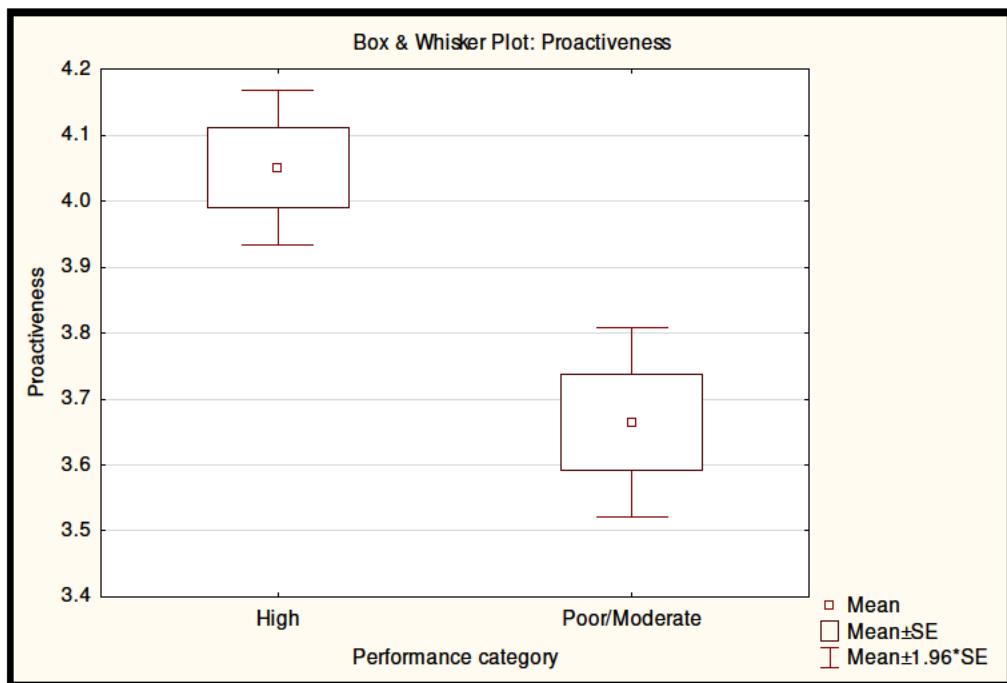
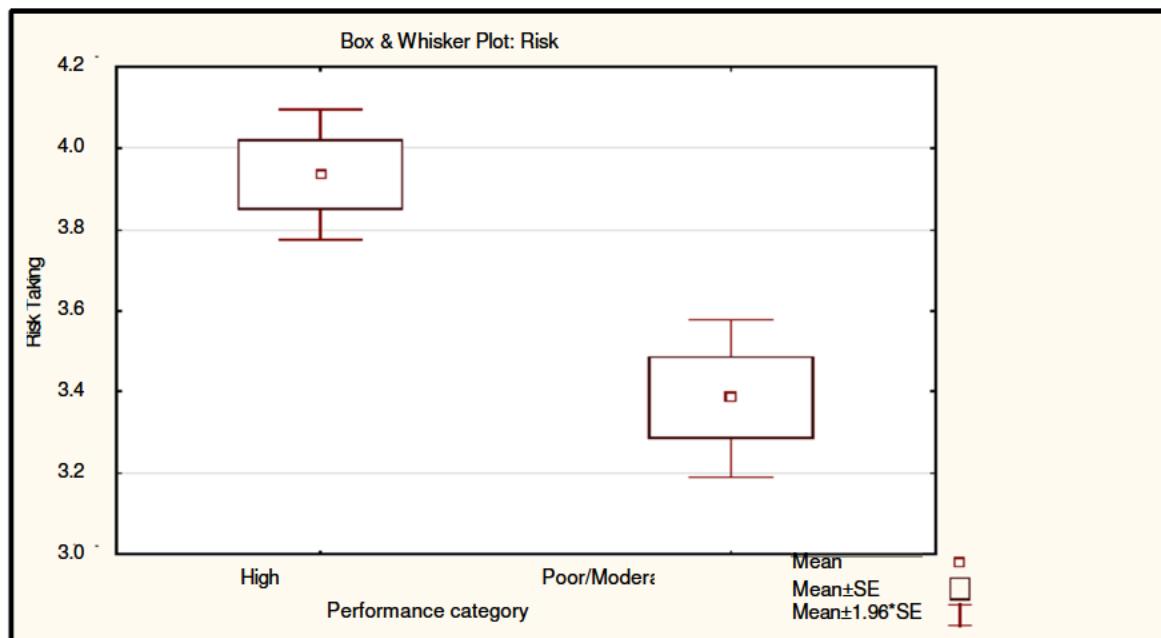


FIGURE 3: BOX & WHISKER PLOT: EO DIMENSION OF PRO-ACTIVENESS AND FIRM PERFORMANCE

To test hypothesis 4 in terms of the association between the EO dimension of risk-taking and company performance, the same procedure was used with ANOVA. Results show a significant difference between the groups, rather than within the groups, at the $p < 0.05$ level which adds support to hypothesis 4.

Similarly, the t-test result indicates a significant difference between the means of these two groups. The box and whisker plot is shown in Figure 4, where a significant difference between the two firm performance groups was observed. Firms with higher levels of risk taking are associated with the 'high performance group'. This association is significant at $p < 0.05$ level and lends support to hypothesis 4.

FIGURE 4: BOX & WHISKER PLOT: EO DIMENSION OF RISK-TAKING AND FIRM PERFORMANCE



In terms of hypothesis 5, the relationship between entrepreneurial culture and company performance, both the ANOVA and t-test results show significant differences between the groups at the $p < 0.05$ level, supporting hypothesis 5.

The box and whisker plot, shown in Figure 5, represents the level of entrepreneurial culture in relation to the two performance groups. The significant difference between the two performance groups was observed where companies with higher levels of

entrepreneurial culture are associated with the 'high performance' group, lending support to hypothesis 5.

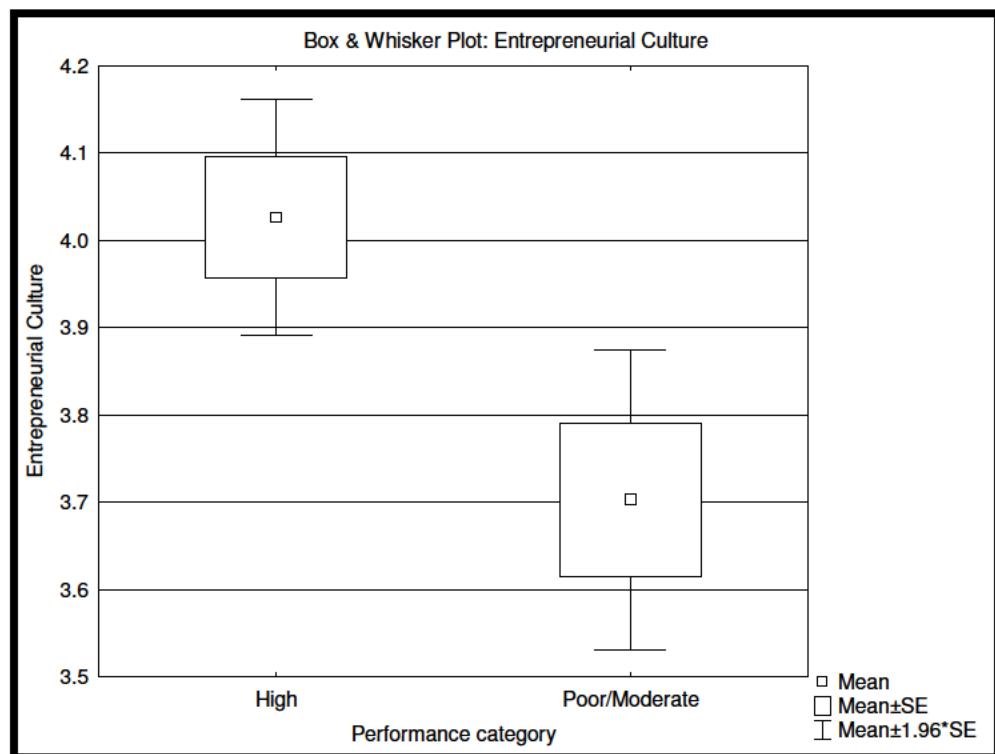


FIGURE 5: BOX & WHISKER PLOT: ENTREPRENEURIAL CULTURE AND FIRM PERFORMANCE

6 CONCLUSION

The aim of this study was to investigate possible links between the EO dimensions, entrepreneurial culture and company performance in the ICT sector. Building on previous CE research the study hypothesised the importance of entrepreneurial behaviour in terms of innovation, risk-taking, pro-activeness, and culture in relation to business performance (Zahra & Covin 1995; Yiu & Lau 2008).

The empirical findings emanating from this study show that the EO dimensions and culture have a significant and positive relationship with higher company performance, adding support to all of the hypotheses. These findings are in line with previous research (Steffens *et al.* 2009; Lumpkin & Dess 1996) where the EO dimensions were related to higher company performance. Innovation tends to lead to higher organisational performance, and innovative companies are able to perform well, even

when they encounter a turbulent environment. This turbulent environment tends to trigger more demand for innovation and this, in turn, leads to high performance.

Firms that take innovation seriously and implement their new ideas are able to prosper and perform better. Innovative firms are those that invest heavily in research and development, as well as new product development. They have leaders with clear vision, who are able to integrate innovation and creativity into the business strategy. Miller (1983) stated that the firm's ability to be a first mover gives it an opportunity to exploit future opportunities ahead of competitors. A company's aggressiveness in pursuit of market opportunities offers the firm an opportunity to improve its performance.

In the ICT sector, environmental dynamism is relatively high due to fast-changing electronic devices, computer software, requirements for fast data throughput and overall technological changes (Esselaar *et al.* 2010). This type of environmental dynamism forces firms to be innovative and proactive in introducing new products, so that they capture better market share and gain competitive advantage over their rivals. From the results of this study, it is clear that innovation and pro-activeness are required for a firm to be associated with high performance.

Similarly risk taking is required in terms of bold actions with regard to introducing new products, risk projects and other activities with uncertain returns (Wang 2008). Risk taking allows managers to tolerate risk and implement a culture of not punishing employees who try and fail (Moreno & Casillas 2008). An entrepreneurial culture allows individuals to implement new ideas and take risks, which is a key element for enhanced business performance. This risk-taking dimension of EO and entrepreneurial culture were found to be crucial elements in stimulating firm performance in previous studies (Zahra & Covin 1995), and are supported with the results from the present study.

All the dimensions of EO are central to understanding the entrepreneurial process, although they may occur in different combinations, depending on the type of entrepreneurial opportunity the firm pursues. EO is manifested across the organisation through an entrepreneurial culture. In conclusion, to argue that firms must learn to act entrepreneurially is no longer a novelty and the reasons they could benefit from doing

so are becoming more evident as a result of mounting empirical evidence from studies such as the present one.

7 RECOMMENDATIONS

In order to maintain or improve performance across a host of financial indicators, it is recommended that ICT companies in South Africa consider introducing and implementing EO through the dimensions of innovation, pro-activeness and risk taking into their businesses. Moreover entrepreneurial culture has been shown to be an important link to performance and without it, employees with a sense of innovation, risk taking and pro-activeness may well experience difficulties.

Since the ICT industry is a fast-growing sector it seems a company must first identify efficient means of being more pro-active, innovative and able to take bold action in implementing new projects in an uncertain environment with the intention of capturing new markets. Managers adopting EO and instilling an entrepreneurial culture will benefit financially, as the implications relate to the profitability and competitiveness of the firm. Intrapreneurial organisations are increasingly judged according to how a firm uses technology and innovation to achieve its objectives, such as maximising profits, gaining market share, creating niche markets or adding value for stakeholders (Bosma, Stam & Wennekers 2010).

The study provides guidance to managers and company leaders interested in undertaking intrapreneurial practices and the links to firm performance. Correspondingly, the result provides direction to employees seeking to engage in intrapreneurship and gives them a fair indication of EO practices which are required. Some specific recommendations are:

- An entrepreneurial culture is required for EO to flourish.
- Increase the number of innovation sponsors (champions) by encouraging managers to help employees getting their work done by removing obstacles and roadblocks.

- Establish a culture more tolerant toward risks, mistakes and failure by allowing employees to take calculated risks and practical experimentation. Accept mistakes and failure as a learning process and learning necessitates mistakes.
- Make innovation the cornerstone of developmental programmes. Develop a set of metrics to track innovation inputs (such as the number of hours devoted to innovative projects), throughputs (such as the number of new ideas entering the company's innovation pipeline), and outputs (such as the cost advantages gained from innovative breakthroughs).
- Institutionalize EO in the firm through which resources are made readily available and accessible in pursuance of new ideas and opportunities.

8 LIMITATIONS AND FUTURE RESEARCH

The research focused on aspects of EO and culture which is often complemented by other variables not accounted for in this study, which may however impact organisational performance, such as and company size (Huse et al. 2005). Future studies may include variables such as company structure, marketing strategy, policies, operations processes, and international activities (Mazzarol & Reboud 2006). Moreover future research could adopt a longitudinal design since a cross-sectional approach as employed in this study loses the dynamic aspects of entrepreneurial behaviour, and prevents conclusions about causal relationships to be drawn among the variables.

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