

ENTREPRENEURIAL INTENSITY: A COMPARATIVE ANALYSIS OF ESTABLISHED COMPANIES IN SOUTH AFRICA

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Abstract

Entrepreneurship is gaining recognition as an important way of attaining a sustainable competitive advantage and positive financial returns. This article compares the entrepreneurial intensity (EI) of Information and Communication Technology (ICT) companies with that of listed JSE companies (excluding ICT listings). A cross-section telephone survey was conducted. The findings suggest that ICT companies are more entrepreneurial than JSE companies. Additionally, the size of a company shows no relation to EI, but age is negatively correlated to EI. By implication, the older the company, the less entrepreneurial it becomes. The findings suggest that organisational factors influence EI and that EI is industry specific. The managerial implication for companies that want to become more entrepreneurial is that they should create organisational conditions conducive to the development of corporate entrepreneurship.

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Introduction

Both large and small companies are urged to act in more innovative and entrepreneurial manners in order to prosper and flourish in the globalised knowledge economy (see Covin & Slevin, 1991; Lumpkin & Dess, 1996; Barringer & Bluedorn, 1999; Leibold, Probst & Gibbert, 2002). However, conventional wisdom often equates entrepreneurship with the single start-up event of a new small business, while entrepreneurship in a corporate environment is sometimes perceived as a contradiction in terms. Innovative acts in larger corporate environments are thus generally not seen as entrepreneurship or entrepreneurial in nature.

Larger companies claim that it is easier for smaller, agile, flexible enterprises to act entrepreneurially. By implication, smaller companies should therefore be able to formulate responses to environmental changes much more

rapidly than larger companies are able to do. Smaller companies, on the other hand, claim that they have to implement survival strategies. They have neither the capacity nor the access to resources (e.g. information and human resources) available to larger companies.

Various authors agree that corporate entrepreneurship (CE) is crucial to the survival, improved financial performance and eventual success of an enterprise, regardless of its size (Zahra, 1995; Knight, 1997; Zahra, Jennings & Kuratko, 1999; Goosen, 2002).

CE and innovation have gained prominence and interest among practitioners and scholars globally. Most of the completed research has been conducted in developed countries like the USA, Canada and certain European countries, while some has been conducted in countries with transitional economies like Slovenia. Limited research has been conducted in developing countries, including South Africa. Locally, only two doctoral studies have been completed on

CE: Struwig (1991) focused on CE as a strategy for managing change and innovation, while Goosen (2002) focused on the link between CE and financial performance.

At a practical level questions remain: What makes one company more entrepreneurial than another? Do company characteristics such as size or age determine a company's entrepreneurial responses? Or are responses prompted by the external environment and the sector in which a company operates? Do certain internal factors play a determining role? In an attempt to answer these questions, this article will compare the entrepreneurial intensity of established companies listed on the Johannesburg Securities Exchange (JSE) with Information and Communication Technology (ICT) companies in respect of corporate characteristics (age, size and sector) and organisational and environmental factors. A theoretical background of CE and entrepreneurial intensity (EI) will be provided. The research methodology will be presented, followed by a discussion of the results. Finally, the managerial implications and opportunities for further research will be highlighted.

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Importance of the research

In South Africa, the innovation imperative is emphasised by intensified competition, national policy and the growth of e-business innovations and the importance of the ICT sector (see Scheepers, 2005; Department of Science and Technology, 2004; Paterson, 2005). The importance of this research can be attributed to the existence of these three factors.

Firstly, despite increased competition in the 'new' economy, too many enterprises still offer their customers similar, 'me too' products. Inadequate competitor differentiation takes place while the majority of companies fail to use the latest technology to gain a sustainable competitive advantage (Scheepers, 2005; Minniti, Bygrave & Autio, 2005). This lack of innovation could lead to the obsolescence of products. For example, DVD technology is fast replacing the video recorder, and digital

cameras are taking the place of photographic film cameras. Lack of innovation could lead even to the decline of an industry, as in the case of the South African textile industry (Jafta, 2003).

Secondly, the national macroeconomic strategy on growth, employment and redistribution (1996) and the White Paper on Science and Technology (1996) emphasise that South Africa has to develop sustainable economic growth, improve its international competitiveness and build its capacity for innovation if it is to overcome some of the economic challenges facing the country. In the new globalised economy, the management of technology, innovation and information has emerged as a key requirement for success in the 21st century. A sound scientific and technological basis from which wealth-creating innovations and applications can develop is therefore essential for improving economic growth in South Africa (Department of Science and Technology, 2004; National Research Foundation, 2004).

Thirdly, the Information and Communication Technology (ICT) sector has been identified in the National Research and Development Strategy as one of the 'leading sectors' in innovation and economic growth (Mbeki, 2002: 1). The industry is expected to show growth rates in excess of 10 per cent in the next three years (Economist Intelligence Unit Survey, 2005). Annual innovations within this industry are reported in the e-Business Handbook (Paterson, 2005). These innovations are elaborated on in concrete and practical terms, but it appears that limited attention has been given to the CE process that takes place in turning ideas into innovations.

The entrepreneurial practices, applied to e-business of two company groups, were compared. The two groups were the ICT companies and companies listed on the JSE (excluding ICT listings). Both groups of companies have participated in the annual e-business survey for over four years and are aware of innovation practices. They also face the pressures of intensified competition and the innovation imperative (Paterson, 2005; Department of Science & Technology, 2004).

3

Literature review / Background

Corporate entrepreneurship (CE) and *entrepreneurial intensity (EI)* have been emphasised by academics and in the popular literature as essential survival strategies for businesses in the new economy (Planting, 2004; Wiklund, 1999; Zahra & Garvis, 2000; Goosen, 2002). But to what, exactly, do the terms CE and EI refer? And what are the main company characteristics and organisational and environmental factors that influence entrepreneurial behaviour in enterprises? This section will explain the term *corporate entrepreneurial intensity* and subsequently analyse some of the factors that influence entrepreneurial behaviour in enterprises.

3.1 Explaining corporate entrepreneurial intensity (CEI)

The term corporate entrepreneurial intensity (CEI) was created by combining two related terms, corporate entrepreneurship (CE) and entrepreneurial intensity (EI). Generally, CE refers to the development of new business ideas and opportunities within large, established corporations (Birkinshaw, 2003: 3). A number of different terms have been used to describe this type of entrepreneurship, such as corporate entrepreneurship (Zahra, 1993; Dess, Lumpkin & McGee, 1999), corporate venturing (Von Hippel, 1977; Altman & Zacharakis, 2003), intrapreneuring (Pinchot III, 1985; Antoncic & Hisrich, 2001; Goosen, 2002), internal corporate entrepreneurship (Burgelman, 1984), internal entrepreneurship (Vesper, 1984), strategic renewal (Guth & Ginsberg, 1990) and venturing (Hornsby, Naffziger, Kuratko & Montagno, 1993).

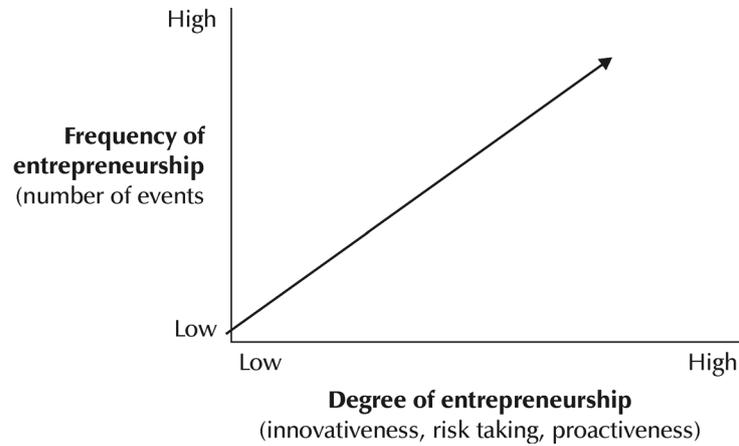
In most cases, corporate entrepreneurship describes the total process whereby established enterprises act in an innovative, risk-taking and proactive manner (Zahra, 1993; Dess *et al.*, 1999; Bouchard, 2001). This behaviour has various outcomes. An outcome may be a new product, service, process or business development. It may be 'new' organisations created as 'spin-out ventures' (Hornsby *et*

al., 1993; Altman & Zacharakis, 2003) or it may involve the restructuring and strategic renewal within an existing enterprise (Volberda, Baden-Fuller & Van den Bosch, 2001). CE is a multi-dimensional phenomenon. Corporate venturing, intrapreneurship and strategic renewal are therefore different components of CE (Hisrich & Peters, 2002: 46; Covin & Slevin, 1989). Where corporate venturing focuses on the creation of new businesses within or outside the existing enterprise, intrapreneurship focuses on the individual who drives the entrepreneurial process. Strategic renewal involves strategy reformulation, reorganisation and organisational change leading to new combinations of resources, often resulting in competitive advantage (Zahra, 1993). In this article, the authors propose that CE be seen as a process through which both formal and informal creative activities are encouraged and intangible resources are managed. In addition, CE aims to create new products, services, processes and businesses to improve and sustain a company's competitive position and financial performance.

Since CE is a process, it should not be seen as a single event, but rather as part of the organisational culture of an enterprise. The level of entrepreneurship will vary in intensity, depending on changes in the culture. The popular view held among scholars is that the variable nature of entrepreneurship can be measured in terms of entrepreneurial orientation (EO) (Barringer & Bluedorn, 1999; Kreiser, Marino & Weaver, 2002). Entrepreneurial orientation consists of three sub-dimensions: innovativeness, risk-taking and proactiveness. However, because Morris and Sexton (1996) regard 'entrepreneurial orientation' as a one-dimensional view of the entrepreneurship phenomenon, they added another dimension, namely frequency of entrepreneurship, and called this phenomenon entrepreneurial intensity (EI). These authors tested EI empirically as a two-dimensional construct. They argue that EI is a function of the degree and frequency of entrepreneurship as shown in Figure 1 (Morris & Sexton, 1996: 7). Frequency of entrepreneurship refers to the number of times an enterprise acts

entrepreneurially (for example, in developing new products or processes), while the degree of entrepreneurship, similar to EO, is measured

by three sub-dimensions: innovativeness, risk-taking, and proactiveness.



Source: Morris and Sexton, 1996:7

Figure 1

The variable nature of entrepreneurship

The first sub-dimension of the degree of entrepreneurship, namely innovativeness, refers to the creation of new products, services and technologies. The second sub-dimension, risk taking, involves the willingness to commit significant resources to opportunities with a reasonable chance of costly failure. These risks are typically calculated and manageable. The third sub-dimension, proactiveness, reflects top management orientation to pursuing enhanced competitiveness, and includes initiative, competitive aggressiveness and boldness (Morris, 1998). Antoncic and Hisrich (2001: 198-499) support Morris and Sexton's (1996: 7) view that EI is a function of degree and frequency of entrepreneurship. Conversely, other authors question the fact of three dimensions to measure the degree of entrepreneurship (EO). Lumpkin and Dess (1996) argue that five dimensions should be used to measure EO, namely autonomy, competitive aggressiveness, proactiveness, innovativeness and risk-taking. In contrast to these views, this article argues for a view of autonomy as an internal condition that influences the organisational climate. Competitive aggressiveness forms part of the proactiveness sub-dimension. Other researchers

support this view (Morris, Allen, Schindehutte & Avila, 2006; Kreiser *et al.*, 2002).

The term corporate entrepreneurial intensity refers to the variable nature of entrepreneurship within an established enterprise. As shown in Figure 1, various positions of EI are possible, as different scores can be obtained on the frequency and degree axes of entrepreneurship (see Figure 1).

Before these dimensions are critically analysed, it is important to acknowledge that theorists' understanding of CEI is in its infancy. Very little empirical work focusing on entrepreneurial intensity specifically has been done in this area (eg Morris & Sexton, 1996; Barringer & Bluedorn, 1999). Morris and Kuratko (2002) argue that different norms of CEI should exist between industries. CEI is expected to differ among departments, divisions, units and geographical areas within the same company. It is also unclear whether high levels of CEI are sustainable. In addition, the influence of environmental and organisational factors on CEI is not clear. This article addresses some of these issues.

3.2 Factors influencing corporate entrepreneurial intensity (CEI)

The CEI of an enterprise is influenced by a number of factors, as shown in Figure 2. This article examines the company characteristics, and organisational and environmental factors that impact on CEI within enterprises in the target population.

3.2.1 Company characteristics

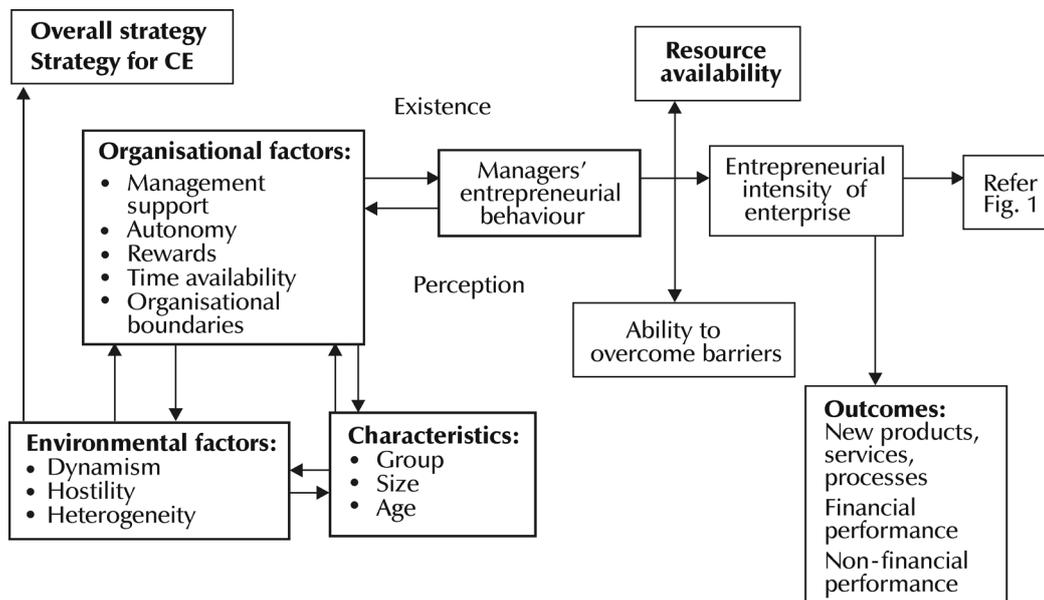
In this study the following characteristics were measured: group, size and age of companies. Size was measured as the number of full-time employees per company. Age was measured using years in existence, while the two main sub-groups were JSE and ICT companies, as discussed in the introduction.

3.2.2 Organisational factors

CE researchers have measured and analysed a number of organisational factors influencing

CEI (see Covin & Slevin, 1991; Damanpour, 1991; Zahra, 1991, 1993, 1995; Zahra & Covin, 1995; Hornsby, Kuratko & Zahra, 2002; Goosen, 2002). These factors both individually and in combination affect the organisational climate that moulds managers' and employees' attitudes towards, and interest in CE efforts (Kuratko, Montagno & Hornsby, 1990). As shown in Figure 2, Hornsby *et al.* (2002) added to the work of other authors and identified a set of organisational factors that are consistent throughout the literature in the field. These factors are management support for CE, work discretion and autonomy of workers, the reward system, the availability of time and organisational boundaries.

Based on extensive research in the field, Hornsby *et al.* (2002) developed and refined the Corporate Entrepreneurship Assessment Instrument (CEAI) to measure the five factors identified in Figure 2.



Adapted from Covin & Slevin (1991); Zahra (1993); Hornsby *et al.* (1993) and Hornsby *et al.* (2002)

Figure 2

A proposed model of corporate entrepreneurship

The first factor, management support, captures the encouragement and willingness of managers to facilitate entrepreneurial activity within an enterprise. Although a company's strategy has

a pervasive influence on its entrepreneurial efforts, strategy in this article is measured by its implementation, that is, management support for innovation. Autonomy refers to

employees' discretion and the extent to which they are empowered to make decisions on the performance of their own work in the way they believe is most effective. Rewards and reinforcement develop individuals' motivation to engage in innovative behaviour. Innovative organisations are characterised by their provision of rewards subject to performance, offering challenges, increasing responsibilities and making the ideas of innovative people known to others in the organisational hierarchy (Kuratko & Hodgetts, 2004). Resource availability seems best represented by time availability. In entrepreneurial work environments, employees are permitted to conduct creative, entrepreneurial experiments in a limited portion of their working time. Finally, a supportive organisational structure, in which low perceived divisions exist among different departments or functions, encourages CE (Morris, 1998; Russell & Russell, 1992; Lumpkin & Dess, 1996; Goosen, 2002).

A supportive organisational climate for CE will therefore be characterised by management support, appropriate rewards, workers who enjoy autonomy, time availability and flexible organisational boundaries between departments. Organisational factors are not the only dimension influencing CEI; environmental factors also play a role.

3.2.3 Environmental factors

The business environment poses challenges and offers new opportunities to companies. In response, companies may initiate innovative strategies or develop entrepreneurial products (services, processes or businesses) to capitalise on opportunities (Zahra, 1991). Managers' perceptions of the environment influence the strategic choices made (Zahra, Nielson & Bogner, 1999). Measuring managers' perceptions of the nature of the environment in South Africa is a complex task, because most empirical research on this phenomenon has been completed in developed countries, while South Africa is still a developing country (Dess & Rasheed, 1991; Zahra, 1991, 1993). When the research reported on in this article was being conducted, no cross-cultural validated research instrument was available. This research therefore measured

three sub-dimensions of the environment that theoretically influence CEI, namely dynamism, hostility and heterogeneity. This was in line with the work of researchers in developed countries, as shown in Figure 2.

Dynamism can be defined as the perceived instability of an enterprise's market, because of the rate, unpredictability and persistence of change in its external environment (Zahra, 1993; Anderson, 2005; Lumpkin & Dess, 2001). Hostility refers to unfavourable environmental changes, which create threats to a company's mission. Hostility arises from several sources like radical industry changes, new legislative requirements placed on an industry, or intensified competition (Zahra & Garvis, 2000; Lumpkin & Dess, 2001). Heterogeneity refers to the complexity of a company's business environment because of the multiple market segments it serves (Dess & Beard, 1984). Dynamic environments create opportunities for companies to act more entrepreneurially. Hostile environments create threats, which may force a company to respond in innovative ways to minimise threats. Heterogeneous environments compel companies to develop entrepreneurial plans to cope with environmental complexity (Zahra, 1991). Thus, in dynamic, hostile and heterogeneous environments, it is anticipated that CEI will be higher.

4

Research methodology

Against the backdrop of the literature review provided, it is expected that CEI will be influenced by not only the organisational climate within an enterprise, but also factors in the internal and external environments. The following hypotheses were tested:

- H₁: A statistically significant relationship exists between frequency and degree of entrepreneurship.
- H₂: Company characteristics influence corporate entrepreneurial intensity (CEI).
- H₃: Company characteristics influence organisational factors supporting CEI.
- H₄: Company characteristics influence environmental factors supporting CEI.

The company characteristics referred to in the hypotheses are size, age and group (JSE or ICT companies).

The purpose of this quantitative study was to compare the e-business CEI of JSE and ICT companies. A cross-sectional survey design consisting of two phases was used: a pilot study to test the measuring instrument and the administration of the telephone survey.

The target population consisted of two groups: JSE-listed; and ICT-listed and non-listed companies. ICT-listed companies were grouped with ICT non-listed companies for the purpose of statistical analysis. The reasons for choosing these two groups were discussed in Section 2. JSE companies were identified by referring to the register of all listed JSE operating companies at the end of 2004. The database obtained from IT Web in May 2005 (IT Web, 2005) was used to identify ICT companies. The final population consisted of 715 companies. The key respondent targeted in JSE-listed companies was the information technology (IT) manager or the chief information officer (CIO), on account of their knowledge of e-business innovations, while the chief executive officer (CEO) or sales manager was the target respondent from ICT companies. Thus a methodology similar to that of the annual e-business survey was followed.

During the pilot study, data was collected by using a questionnaire and conducting personal interviews with the middle- and senior- level managers of 41 companies in the Gauteng area. The data of the pilot study was used to determine whether questions were clear and understandable, and how much time it would take to complete the questionnaire. The results of the pilot study determined the refinement of the questionnaire. A telephone survey was conducted from August to October 2005. A total of 315 respondents participated in the survey, providing a response rate of 44 per cent. Data was captured electronically during the interview.

A measuring instrument was developed to measure CEI, company characteristics, and the organisational and environmental factors that influence the CEI within South African enterprises. In order to ensure the validity and

reliability of the measuring instrument, it was essential to define the key dimensions clearly. Items from existing measuring instruments that had proved reliable and valid in previous research studies were used where possible. These were enhanced by questions formulated by the researcher, and based on the literature to ensure that each variable in the measuring instrument was represented by at least three items. Useful existing research instruments were the Entrepreneurial Performance Index (EPI) of Morris and Sexton (1996); the ENTRESALE (Kwandwalla, 1977; Miller & Friesen, 1983; Covin & Slevin, 1989; Knight, 1997); Zahra's CE scale (1991, 1993, 1995) and the Corporate Entrepreneurship Assessment Instrument (CEAI) of Hornsby, Kuratko and Montagnò (1999).

Cronbach Alpha coefficients were computed and used to assess the internal consistency of the measuring instrument on responses obtained from the pilot study. Where coefficients were lower than 0.6, dimensions were reworded and adapted before the new items in the telephone survey were tested. A nine-point Likert scale was used to record the responses during the telephone survey. Dimensions measured were frequency and degree of entrepreneurship, and organisational and environmental factors. The estimated Cronbach Alpha co-efficients for the dimensions frequency, degree of entrepreneurship and organisational factors were 0.79, 0.66 and 0.70 respectively. These coefficients would appear to satisfy Nunally's (1978) suggested minimum criterion for internal reliability. Coefficients lower than 0.5 are regarded as questionable, coefficients close to 0.70 as acceptable and coefficients of 0.80 as good (Sekaran, 1992:174). As the estimated Cronbach alpha coefficient for environmental factors was 0.16, it was excluded from further analysis.

Statsoft, Inc (2005) was used to conduct the statistical analysis. The following descriptive statistics were used for the initial descriptive analysis: mean, median, standard deviation and coefficient of variance. Significant differences and correlations were used to compare the two groups and to test the hypotheses.

5 Results

Corporate characteristics and a descriptive analysis are presented in this section. Thereafter the comparative analyses of specific dimensions will be discussed.

5.1 Corporate characteristics of respondents

The corporate characteristics of the respondents are discussed in terms of the three variables: group, size and age. More JSE companies

(61 per cent) participated in the survey than did the 39 per cent of ICT companies. The size and age of companies participating in the survey are shown in Figure 3. The number of permanent employees determined company size. Respondents' answers were categorised into eight 'size' categories, as shown in Figure 3. The largest category (35 per cent) includes companies with 1-99 employees. However, when all the categories with above 200 employees (usually seen as large companies) are taken into account, it adds up to 56 per cent of the respondents.

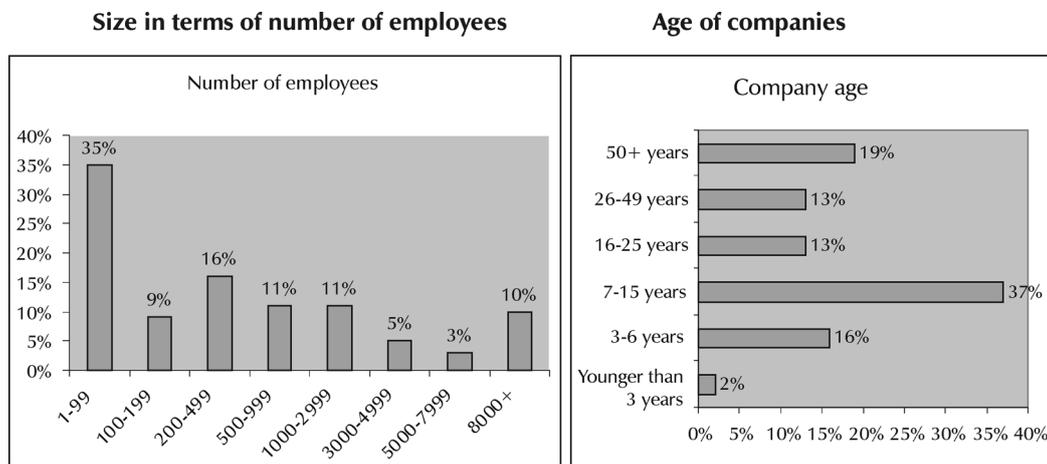


Figure 3
Size and age of companies

Companies were also categorised according to their age, that is, years of existence. Respondents' answers were categorised into six categories as shown in Figure 3. The largest group of respondents (37 per cent) falls into the category 7-15 years of age. Companies younger than seven years include 18 per cent of the respondents, while companies older than 15 years amounted to 45 per cent. It should also be noted that only 2 per cent (7 out of 302 companies) were younger than three years.

5.2 Descriptive analysis of the dimensions

A descriptive analysis of the dimensions was conducted as part of an exploratory approach to analysis of the data. A profile of the respondents participating in the study is shown in Table 1, using the mean, standard deviation and coefficient of variance.

Table 1
Descriptive statistics of constructs

Construct / Dimension	N	Mean	Average percentage	Standard deviation	Coefficient of variance
Frequency	230	22.95	64%	5.18	22.57%
Degree of entrepreneurship	315	16.75	62%	3.92	23.40%
Organisational factors	315	30.85	69%	4.71	15.27%
Environmental factors	315	15.00	56%	2.71	18.07%

Respondents answered all the questions pertaining to the degree of entrepreneurship, organisational factors and environmental factors, but only 230 respondents answered all the questions pertaining to frequency. Because a company can show varying activity levels in product and/or service and/or process and/or business development, only 230 companies were active on all four of these frequency levels.

All the questions were measured on a nine-point scale. The mean of frequency was calculated from four constructs, the degree of entrepreneurship from three, the organisational factors from five and the environmental factors from three. The standard deviation shows how the observations are spread around the mean. The coefficient of variance describes how large the measure of dispersion is relative to the mean of the observations among different random variables. From Table 1 it can be derived that observations of respondents on the frequency and degree of entrepreneurship are spread in a pattern similar to each other, while observations on organisational and environmental factors show a similar common dispersion pattern. Opinions of respondents on the frequency and degree of entrepreneurship differ from the views of respondents on organisational and environmental factors. A reason for this could be that organisational and environmental factors, as shown in Figure 2, are antecedents to the entrepreneurial process. Depending on an enterprise's combination of organisational and environmental factors, various different positions in terms of EI are thus possible.

5.3 Comparative analyses

In this section the aim is to determine whether certain key variables are significantly associated, and furthermore whether certain sub-groups are significantly different. Correlations among certain variables were calculated, and the F-statistic and p-values were used to determine whether the differences among groups were significant. The focus is on the following specific dimensions:

- corporate entrepreneurial intensity (ie frequency and degree of entrepreneurship),
- company characteristics (sector, age, size) and CEI, and
- organisational factors.

An assumption inherent to the CEI concept is that a direct relationship exists between frequency and degree of entrepreneurship. Figure 4 shows a scatterplot where the strength of the association between frequency and degree of entrepreneurship is illustrated. A positive linear relationship exists between frequency and degree of entrepreneurship at the 99 per cent significance level ($r=0.375$; $p<0.01$).

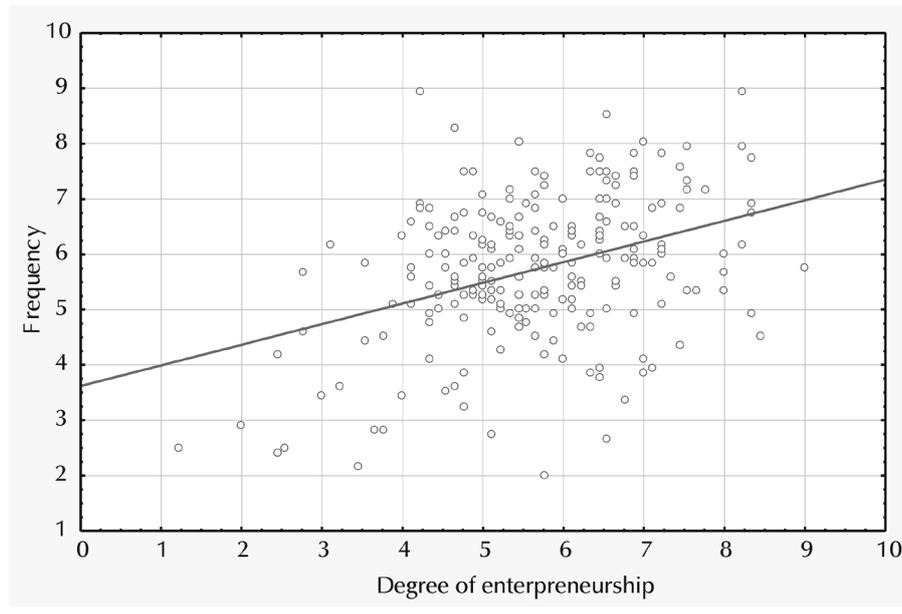


Figure 4

Scatterplot of frequency and degree of entrepreneurship

5.3.1 Company characteristics

In Table 2, the mean scores of each sub-group and the associated 95 per cent confidence intervals, F-tests and probability values are shown. There was a significant difference between JSE and ICT companies regarding their corporate entrepreneurial intensity (CEI) at the 5 per cent significance level. The mean for

CEI is calculated by summing the degree and frequency scores, each measured on a nine-point scale. The mean score for the JSE companies was 11.10, with a lower limit of 10.73 and an upper limit of 11.47. However, the score of the ICT companies as a group was higher, with a mean score of 11.68, and a lower limit of 11.26 and upper limit of 12.11.

Table 2

Groups compared: CEI and organisational factors

Groups compared	Mean	95% confidence limit	F test	P value
JSE CEI vs ICT CEI			F = 4.13	0.043*
JSE CEI	11.10	10.73 – 11.47		
ICT CEI	11.68	11.26 – 12.11		
JSE vs ICT frequency			F = 0.02	0.88
JSE frequency	5.71	5.48 – 5.94		
ICT frequency	5.73	5.47 – 6.00		
JSE vs ICT – degree			F = 11.88	0.001**
JSE degree	5.35	5.17 – 5.53		
ICT degree	5.87	5.64 – 6.10		
JSE vs ICT – organisational factors			F = 5.58	0.019*
JSE organisational factors	6.08	5.95 – 6.22		
ICT organisational factors	6.34	6.17 – 6.52		

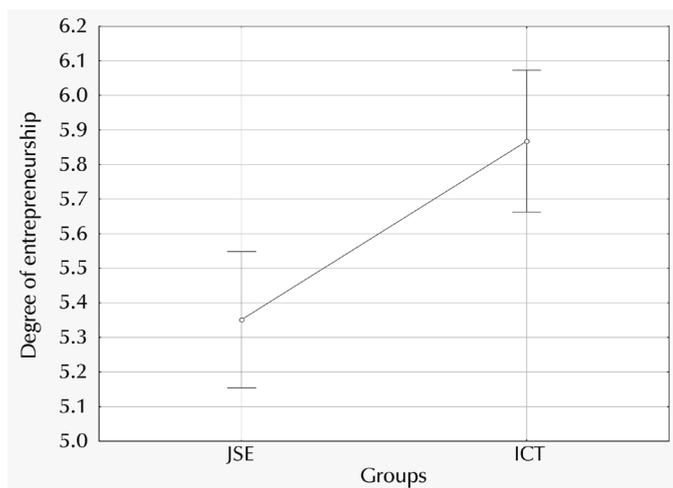
* Significant $p < 0.05$

** Significant $p < 0.01$

The JSE companies' mean score on the frequency dimension was 5.71, while the ICT mean score was 5.73. The difference between the means of the two groups was not statistically significant ($p = 0.88$, thus $p > 0.05$).

The statistically significant difference between the two groups becomes clear when the degree

of entrepreneurship is examined. A significant difference existed between JSE and ICT companies ($p < 0.01$) regarding the degree of entrepreneurship. The score of the JSE companies, as a group, was 5.35, while ICT companies' score was higher at 5.87, as can be seen in Figure 5.



Vertical bars denote 0.95 confidence intervals

Figure 5

Box plot: JSE and ICT companies, compared in terms of degree of entrepreneurship

Table 2 shows that, as could be expected (from the degree of entrepreneurship), significant differences existed between JSE and ICT companies regarding the organisational factors influencing CEI. JSE companies scored 6.08, while ICT companies scored higher, at 6.35.

5.3.2 The influence of company size on corporate entrepreneurial intensity

No statistically significant correlation existed between company size, measured by the number of employees, organisational factors and CEI or its sub-dimensions: frequency and degree of entrepreneurship (see Table 3). Goosen (2002) supports this finding, confirming that, within South African companies, company size does not have an influence on the levels of entrepreneurship.

Table 3

Company size: Comparison CEI and organisational factors

Company size compared:	Correlation	P-value
Company size vs CEI	$r = 0.08$	0.26
Company size vs frequency	$r = 0.09$	0.19
Company size vs degree	$r = -0.01$	0.82
Company size vs organisational factors	$r = -0.03$	0.63

* Significant $p < 0.05$

** Significant $p < 0.01$

5.3.3 The influence of company age on corporate entrepreneurial intensity

An assessment of the relationship between company age, CEI and organisational factors gives rise to several interesting observations. Table 4 indicates that company age has a poor negative correlation with CEI. The negative

correlation between company age and frequency was not significant. However, company age and degree of entrepreneurship showed a negative correlation that was significant at the 1 per cent level ($p < 0.01$). Furthermore, a negative correlation also existed between company age and organisational factors at the 5 per cent level ($p < 0.05$).

Table 4
Company age: comparison CEI and organisational factors

Company age compared:	Correlation	P value
Company age vs CEI	$r = -0.13$	0.07
Company age vs frequency	$r = -0.03$	0.64
Company age vs degree	$r = -0.20$	0.00**
Company age vs organisational factors	$r = -0.12$	0.03*

* Significant $p < 0.05$

** Significant $p < 0.01$

If significant differences in the degree of entrepreneurship and the organisational factors existed, the next question that arose was whether there were significant differences between the various categories of age groupings regarding the dependent and independent

variables. Table 5 aims to answer this question by showing the various age classifications, the mean scores obtained relative to CEI, the frequency and degree of entrepreneurship and the organisational factors.

Table 5
Company age: comparison CEI and organisational factors

Age classifications	n	CEI	Frequency	Degree	Organisational factors
Younger than 3 yrs	7	11.27	5.27	6.00	5.77
3-6 yrs	46	11.88	5.80	6.03	6.40
7-15 yrs	107	11.25	5.66	5.53	6.29
16-25 yrs	38	11.72	5.89	5.77	6.16
26-49 yrs	37	11.24	5.80	5.36	6.09
50+ yrs	56	10.89	5.60	5.12	5.99
F statistic		1.03	0.36	3.19	1.66
P Value		0.40	0.88	0.01*	0.15

* Significant $p < 0.05$

** Significant $p < 0.01$

Note: The p-values and F statistics representing the various age classifications show whether significant statistical differences exist regarding CEI, frequency, degree and organisational factors.

As can be seen in Table 5, there were no significant differences among the various age classifications regarding CEI and frequency. However, when the degree of entrepreneurship was analysed, there were seen to be significant differences between the various age classifications ($p < 0.05$). The findings suggest that as companies grow older the degree of entrepreneurship declines. It may be possible to postulate that younger companies' policies, procedures and routines are not formalised and that employees solve problems as they arise. These solutions may sometimes be unconventional and more creative, compared with those of older companies, where formal policies and procedures may guide more bureaucratic decision-making.

When company age was correlated with the organisational factors, the probability value indicated that the differences in the age groupings were not statistically significant. The findings may be distorted because only seven companies among the respondents had been operating for fewer than three years; another analysis that excluded these seven companies was therefore carried out. The results, shown in Figure 7, suggest that, in terms of organisational factors, differences between the age classifications of companies were not statistically significant ($p = 0.16$). However, a declining trend is discernible. In other words, as companies increase in age, the internal organisational factors become less supportive of entrepreneurship.

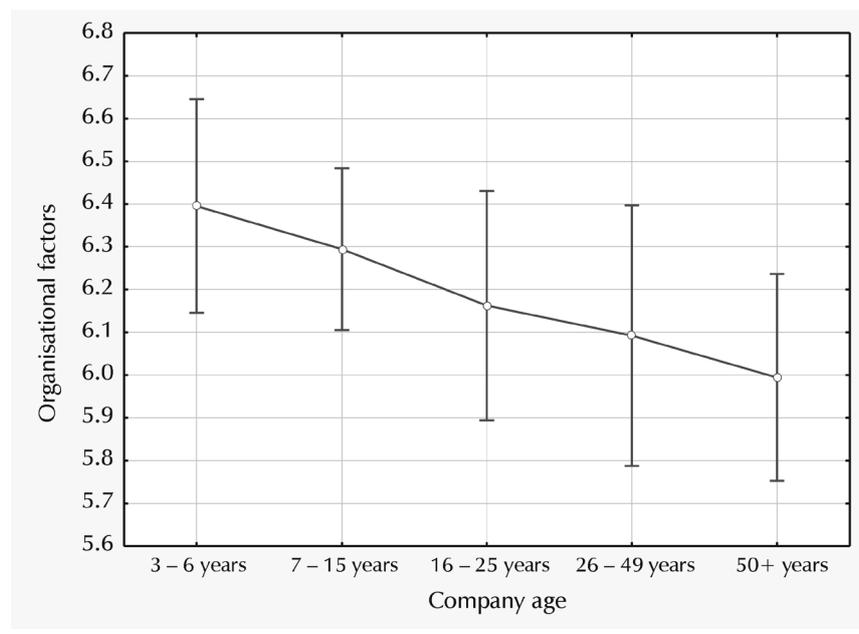


Figure 7

Companies older than three years vs organisational factors

6

Discussion of results

The discussion of results in this section will focus on the relationship between frequency and degree of entrepreneurship and the influence of company characteristics on corporate entrepreneurial intensity, organisational factors and environmental factors.

First, a statistically significant relationship was found between the frequency and degree of entrepreneurship. By implication, the number of times an enterprise acts entrepreneurially is related to the degree of risk-taking, innovativeness and proactiveness. Morris and Kuratko (2002) argue that enterprises should engage in a number of entrepreneurial projects and experiment with various projects, in other words, they should increase the frequency of

entrepreneurship. The work of Zahra (1993), Covin and Slevin (1991) and Kreiser *et al.* (2002) is consistent with the argument by Morris and Kuratko (2002). All these authors focus on growth orientation as the defining characteristic of CE. In other words, growth implies repeated entrepreneurial acts. Firms producing a single entrepreneurial business, such as a single invention over a long period of time, are thus not considered particularly entrepreneurial. Rather, a continued effort to develop new products, services, markets and processes, amongst other things, is indicative of a highly entrepreneurial enterprise.

Secondly, the results, presented in Section 5, indicate that CEI is influenced by certain company characteristics. The company characteristics used to differentiate among the companies were group, size and age. In a comparison of ICT and JSE companies, the results show that ICT companies are more entrepreneurial than JSE companies (excluding ICT-listed companies). One reason for the difference between them may thus be the fact that they operate in different industry conditions with different requirements for success. In the case of JSE companies, shareholders may value stability, while ICT companies need to focus on immediate accommodation of changing market conditions. A further reason may be that there are different CEI norms for different industries, as argued by Morris and Kuratko (2002).

Size as a company characteristic does not influence EI, but age does. The older the companies, the less entrepreneurial they become. This could be ascribed to policies and routines being formalised and entrenched as companies mature, with the result that employees tend to follow the 'rules' and do not act innovatively. Furthermore, the implication of this finding is that CEI as a new, separate concept does not exist. The entrepreneurial behaviour of both small and large companies varies in intensity, so size cannot be used to distinguish between different types of entrepreneurial intensity. The term EI captures the variable nature of the entrepreneurship phenomenon, which presents itself in different contexts (large and small companies).

Thirdly, statistically significant differences exist between JSE and ICT companies when organisational factors are compared. The organisational climate of ICT companies appears to be more supportive of entrepreneurial behaviour than it does in JSE companies. In other words, in ICT companies there appears to be more support for CE from management. Rewards to encourage CE are in place, flexible organisational boundaries exist, time to solve problems in an entrepreneurial manner is available, and employees enjoy greater autonomy in comparison to those in JSE companies. The reason for this may be that the target respondent interviewed in ICT companies is an active problem-solver serving customer needs, while the JSE companies may see e-business as a support function and are themselves the customers. From a customer's point of view, the service provider is often expected to be more innovative than the customer. However, when company size and organisational factors are compared, no correlation is found between the two concepts. A negative, but statistically significant relationship exists between company age and organisational factors. In other words, it is not size that matters, but age. The older an enterprise becomes, the less supportive the organisational climate becomes for entrepreneurship.

Finally, although no direct relationship was found between frequency of entrepreneurship and company characteristics, frequency does indirectly affect EI, because a positive correlation exists between frequency and degree of entrepreneurship. As discussed at the beginning of this section, a company's orientation towards growth and continual focus on developing new products, services, processes and businesses, are indicative of higher levels of the degree of entrepreneurship.

7

Further research

Although the study had certain limitations, for example, one respondent per company, a singular focus on e-business and the inability to measure external factors, several avenues

for further research exist. Avenues with both practical and academic relevance are identified below.

- This article reports on a study in which a large-scale empirical survey was conducted, comparing two different company groups. It appears that few surveys focusing on the entrepreneurial intensity of a large number of companies have been conducted in South Africa. Resource limitations allowed for data collection of only one respondent per company. It is suggested that further research triangulate the views of one respondent with secondary sources, or that multiple respondents per company be involved.
- Because CE is such a comprehensive topic, the focus of the broader study was on e-business. This being the case, caution should be exercised in generalising the findings. Future research should test them across sectors, company size and age. Longitudinal surveys should also be conducted to ascertain whether high levels of entrepreneurial intensity are sustainable over time.
- A reliable measuring instrument should be developed to measure the environmental factors and determine which environmental conditions are conducive to CE. The interaction between the organisational climate and environmental conditions is also an avenue of research that would add value for managers. Findings in this regard would enable managers to assess their internal and external environments and use these assessments as input for their strategic processes.

8

Conclusion

The purpose of this study was to compare the e-business entrepreneurial intensity of JSE and ICT companies. Company characteristics, organisational factors and environmental factors were compared. The findings support the literature to a great extent. It has been confirmed that EI varies among different

industries or company groups. ICT companies are more entrepreneurial than JSE companies. The reasons for this might be that e-business impacts the main operations of ICT companies, while JSE companies may view e-business only as a support function.

The organisational factors that support EI are linked to the level of entrepreneurship within companies. The organisational climate of ICT companies is more supportive of entrepreneurial behaviour than that of JSE companies. The managerial implication is that JSE companies that aim to become more innovative and entrepreneurial ought to develop management support for CE, implement CE rewards, allow their employees greater autonomy and time to work on creative solutions and bring employees from different parts of the company together.

The theoretical advance offered by this article is two-fold. First, different industries or groups of companies differ in terms of EI. This finding addresses one of the gaps in the CE field identified by Morris and Kuratko (2002). Further research should aim to develop norms within specific industries for appropriate levels of EI. Secondly, this article contributes to understanding the role of organisational factors. The fact that the organisational climates of ICT companies are more supportive of EI implies that support for CE, rewards, time availability, flexible organisational boundaries and autonomy of employees are important factors if a company wishes to develop entrepreneurially.

Interestingly, the findings presented in this article show that it is not the size of companies that matters, but age. As companies grow older and become more established, their degree of entrepreneurship declines. As companies' age and their problem-solving approaches, policies and procedures become part of routine and they are recorded, they tend to solve problems habitually and not in an entrepreneurial manner. Additionally, the implication of this finding is that CEI, as a new, separate concept, does not exist. The term corporate entrepreneurial intensity is inappropriate. The term EI captures the variable nature of the entrepreneurship phenomenon, which can manifest in different contexts in both large and small companies.

Although no direct relationship was found between the frequency of entrepreneurship and company characteristics, frequency does indirectly affect degree of entrepreneurship, because a significant positive correlation exists between frequency and degree of entrepreneurship.

Further research should focus on using multiple respondents, validating the findings across different industries and developing a reliable measuring instrument for measuring environmental conditions conducive to entrepreneurial behaviour within the South African context.

References

- 1 ALTMAN, J. & ZACHARAKIS, A.L. (2003) "An integrated model for corporate venturing", *Journal of Private Equity*, 6(4): 68-76.
- 2 ANDERSEN, T.J. (2005) "The performance effect of computer-mediated communication and decentralized strategic decision making", *Journal of Business Research*, 58(8): 1059-1067.
- 3 ANTONCIC, B. & HISRIC, R.D. (2001) "Intrapreneurship: Construct refinement and cross-cultural validation", *Journal of Business Venturing*, 16: 495-527.
- 4 BARRINGER, B.R. & BLUEDORN, A.C. (1999) "The relationship between corporate entrepreneurship and strategic management", *Strategic Management Journal*, 20: 421-444.
- 5 BIRKINSHAW, J. (2003) "The paradox of corporate entrepreneurship", *Strategy & Business* [online] Available from <http://www.strategy-business.com/newsarticle>, [Accessed 22 January 2004].
- 6 BOUCHARD, V. (2001) "Exploring corporate entrepreneurship: A corporate strategy perspective", paper delivered at *European Entrepreneurial Learning Conference*, December 2001: Lyon.
- 7 BURGELMAN, R.A. (1984) "Design for corporate entrepreneurship in established firms", *California Management Review*, 16(3): 154-166, Spring.
- 8 COVIN, J.G. & SLEVIN, D.P. (1989) "Strategic management of small firms in hostile and benign environments", *Strategic Management Journal*, 10: 75-87.
- 9 COVIN, J.G. & SLEVIN, D.P. (1991) "A conceptual model of entrepreneurship as firm behaviour", *Entrepreneurship Theory and Practice*, 16(1): 7-25.
- 10 DAMANPOUR, F. (1991) "Organisational innovation: A meta-analysis of the effects of determinants and moderators", *Academy of Management Journal*, 34: 555-590.
- 11 DEPARTMENT OF SCIENCE AND TECHNOLOGY (DST) (2004) *National Research & Development Strategy* [Online] Available from: http://www.dst.gov.za/legislation_policies/strategic_reps/sa_nat_rd_strat.htm [Accessed 18 January 2006].
- 12 DESS, G.G. & BEARD, D.W. (1984) "Dimensions of organisational task environment", *Administrative Science Quarterly*, 29: 52-73.
- 13 DESS, G.G.; LUMPKIN, T.T. & MCGEE J.E. (1999) "Linking CE to strategy, structure, and process: Suggested research directions", *Entrepreneurship Theory & Practice*, Spring 99: 85-102.
- 14 DESS, G. & RASHEED, A. (1991) "Conceptualising and measuring organisational environments: A critique and suggestions", *Journal of Management*, 17: 701-710.
- 15 ECONOMIST INTELLIGENCE UNIT SURVEY (2005) "Industry forecasts". [online] Available from: http://www.eiu.com/site_info.asp?info_name=ps_industry_forecasts&entry1=psNav&page=noads [Accessed: 18 January 2006].
- 16 GOOSEN, G.J. (2002) "Key factor intrapreneurship: The development of a systems model to facilitate the perpetuation of entrepreneurship in large South African organisations", Unpublished doctoral dissertation, Stellenbosch: University of Stellenbosch.
- 17 GUTH, W. & GINSBERG, A. (1990) "Guest editor's introduction: Corporate entrepreneurship", *Strategic Management Journal*, 11: 5-16.
- 18 HISRIC, R.D. & PETERS, M.P. (2002) *Entrepreneurship* (5th ed.) McGraw-Hill: New York.
- 19 HORNSBY, J.S.; NAFFZIGER, D.W.; KURATKO, D.F. & MONTAGNO, R.V. (1993) "An interactive model of the corporate entrepreneurship process", *Entrepreneurship Theory & Practice*, Winter 58(1): 28-39.
- 20 HORNSBY, J.S.; KURATKO, D.F. & MONTAGNO, R.V. (1999) "Perception of internal factors for corporate entrepreneurship: a comparison of Canadian and US managers", *Entrepreneurship Theory & Practice*, 58(1): 9-24.
- 21 HORNSBY, J.S.; KURATKO, D.F. & ZAHRA, S.A. (2002) "Middle managers' perception of the internal environment for corporate entrepreneurship: Assessing a measurement scale", *Journal of Business Venturing*, 17: 253-273.

- 22 IT WEB (2005) *Virtual Press Offices*. Available from: <http://www.itweb.co.za/sections/default.asp> [Accessed 5 January 2005].
- 23 JAFTA, R.C.C. (2003) "The introduction of new technology in a mature industry: An evolutionary analysis of the South African textile industry", Unpublished doctoral dissertation, University of Stellenbosch.
- 24 KANTER, R.M. (1985) "Supporting innovation and venture development in established companies", *Journal of Business Venturing*, 1: 47-60.
- 25 KNIGHT, G.A. (1997) "Cross-cultural reliability and validity of a scale to measure firm entrepreneurial orientation", *Journal of Business Venturing*, 12(3): 213-225.
- 26 KREISER, P.; MARINO, L. & WEAVER, L.M. (2002) "Assessing the relationship between entrepreneurial orientation, the external environment and firm performance", *Frontiers of Entrepreneurship Research: Babson* Available from: http://www.babson.edu/entrep/fer/Babson2002/XVII/XVII_S4/SVII_S4_nav.html [Accessed 12 June 2004].
- 27 KURATKO, D.F.; MONTAGNO, R.V. & HORNSBY, J.S. (1990) "Developing an intrapreneurial assessment instrument for an effective corporate entrepreneurial environment", *Strategic Management Journal*, 11: 49-58.
- 28 KURATKO, D.F. & HODGETTS, R.M. (2004) *Entrepreneurship: Theory, Process and Practice* (6th ed.) Thompson South-Western: USA.
- 29 KWANDWALLA, P.N. (1977) *The Design of Organisations*, Harcourt, Brace, Jovanovich: New York.
- 30 LEIBOLD, M.; PROBST, G. & GIBBERT, M. (2002) *Strategic Management in the Knowledge Economy*, Publicis & Wiley: Germany.
- 31 LUMPKIN, G.T. & DESS, G.G. (1996) "Clarifying entrepreneurial orientation construct and linking it to performance", *Academy of Management Review*, 21(1): 135-172.
- 32 LUMPKIN, G.T. & DESS, G.G. (2001) "Linking two dimensions of entrepreneurial orientation to firm performance: the moderating role of environment and industry life cycle", *Journal of Business Venturing*, 16(5): 429-451.
- 33 MBEKI, T. (2002) "The context for the national R&D strategy", In: DST, 2002 *National Research & Development Strategy*, Available from: http://www.dst.gov.za/legislation_policies/strategic_reps/sa_nat_rd_strat.htm [Accessed 18 January 2006].
- 34 MILLER, D. & FRIESEN, P. (1983) "Strategic-making and environment: The third link", *Strategic Management Journal*, 4(3): 221-235.
- 35 MINNITI, M.; BYGRAVE, W.D. & AUTIO, E. (2005) *Global Entrepreneurship Monitor 2005 Executive Report*, Babson College and London School of Business.
- 36 MORRIS, M.H. (1998) *Entrepreneurial Intensity: Sustainable Advantages for Individuals, Organisations and Societies*, Quorum Books: Westport.
- 37 MORRIS, M.H.; ALLEN J.; SCHINDEHUTTE M. & AVILA, R.A (2006) "Balanced management control systems as a mechanism for achieving corporate entrepreneurship", *Working Paper*, Syracuse University: New York.
- 38 MORRIS, M.H. & KURATKO, D.F. (2002) *Corporate Entrepreneurship*, Harcourt College Publishers: Orlando, Florida.
- 39 MORRIS, M.H. & SEXTON, D.L. (1996) "The concept of entrepreneurial intensity: Implications for company performance", *Journal of Business Research*, 36: 5-13.
- 40 NATIONAL MACRO ECONOMIC STRATEGY ON GROWTH, EMPLOYMENT AND REDISTRIBUTION (1996) {Online} Available from: <http://www.polity.org.za/html/govdocs/policy/growth.html> [Accessed 25 January 2006].
- 41 NATIONAL RESEARCH FOUNDATION (NRF) (2004) "Focus area: Economic growth and international competitiveness" [Online] Available from: <http://www.nrf.ac.za/focusareas/index.stm> [Accessed 11 July 2004].
- 42 NUNNALLY, J.C. (1978) *Psychometric Theory*, McGraw-Hill: New York.
- 43 PATERSON, J. (ed) (2005) *The E-Business Handbook: The 2005 Review of Innovation at Work in South African Business*, ITWeb Informatica: Cape Town.
- 44 PLANTING, S. (2004) "Listen, learn, lead and support excellence", *Innovations*, March: 7-10.
- 45 PINCHOT III, G. (1985) *Intrapreneuring: You Don't Have to Leave the Corporation to Become an Entrepreneur*, Harper & Row: New York.
- 46 RUSSELL, R.D. & RUSSELL, C.J. (1992) "An examination of the effects of organisational norms, organisational structure, and environmental uncertainty on entrepreneurial strategy", *Journal of Management*, 18(4): 639-656.
- 47 SCHEEPERS, M.J. (2005) "How innovative are South African firms?" in M. von Broembsen, Wood, E. & Herrington, M. (eds.) *Global Entrepreneurship Monitor: South African Report 2005*, Centre for Innovation and Entrepreneurship, Cape Town: UCT Graduate School of Business.

- 48 SEKARAN, U. (1992) *Research Methods for Business: A Skill Building Approach* (2nd ed.) John Wiley: New York.
- 49 STATSOFT, INC (2005) STATISTICA (data analysis software system) version 7.1. www.statsoft.com.
- 50 STRUWIG, F.W. (1991) "Intrapreneurship: A strategy for managing change and innovation", Unpublished DPhil dissertation, Vista University: Port Elizabeth.
- 51 VESPER, K. H. (1984) "Three faces of corporate entrepreneurship: A pilot study", in J.A. Hornaday, F. Tarpley, Jr., J. A. Timmons, & K. H. Vesper (eds.) *Frontiers of Entrepreneurship Research*: 294-326, Babson College: Wellesley, MA.
- 52 VOLBERDA, H.W.; BADEN-FULLER, C. & VAN DEN BOSCH, F.A.J. (2001) "Mastering strategic renewal: Mobilising renewal journeys in multi-unit firms", *Long Range Planning*, 34(2001): 159-178.
- 53 VON HIPPEL, E. (1977) "Successful and failing internal corporate ventures: An empirical analysis", *Industrial Marketing Management*, 6: 163-174.
- 54 WHITE PAPER ON SCIENCE AND TECHNOLOGY (1996) [Online] Available from: http://www.polity.org.za/html/govdocs/white_papers/scitech.html [Accessed: 25 January 2006].
- 55 WIKLUND, J. (1999) "The sustainability of the entrepreneurial orientation-performance relationship", *Entrepreneurship Theory and Practice*, Fall: 37-48.
- 56 ZAHRA, S.A. (1991) "Predictors and financial outcomes of corporate entrepreneurship: An exploratory study", *Journal of Business Venturing*, 6(4): 259-285.
- 57 ZAHRA, S.A. (1993) "Environment, corporate entrepreneurship and financial performance: A taxonomic approach", *Journal of Business Venturing*, 8(4): 319-340.
- 58 ZAHRA, S.A. (1995) "Corporate entrepreneurship and financial performance: The case of management leveraged buyouts", *Journal of Business Venturing*, 10: 225-247.
- 59 ZAHRA, S.A. & COVIN, G. (1995) "Contextual influences on the corporate entrepreneurship-performance relationship: A longitudinal analysis", *Journal of Business Venturing*, 10: 43-58.
- 60 ZAHRA, S.A. & GARVIS, D.M. (2000) "International corporate entrepreneurship and company performance: The moderating effect of international environmental hostility", *Journal of Business Venturing*, 15: 469-492.
- 61 ZAHRA, S.A.; JENNINGS, D.F. & KURATKO, D.F. (1999) "The antecedents and consequences of firm-level entrepreneurship: The state of the field", *Entrepreneurship Theory & Practice*, Winter: 45-65.
- 62 ZAHRA, S.A.; NIELSEN, A.O. & BOGNER, A.C. (1999) "CE, knowledge, and competence development", *Entrepreneurship Theory and Practice*, Spring: 169-189.